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## CONTENTS

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## CONTENTS FOR NOVEMBER, 1930

## ECONOMIC ASPECTS OF THE BOULDER
## DAM PROJECT [1]

### SUMMARY

I. Complexity of the issues, 177. — II. The Colorado River Basin, 181; Interests of the Imperial Valley in the project, 181; Interests of Los Angeles and neighboring cities, 183. — III. Interests of the Upper-Basin States, 185; The Colorado River Compact, 188; Arizona's interests, 188. — IV. Cost estimates and other figures, 191. — V. Administrative aspects of the Boulder Dam project act, 192; Financial provisions of the act, 194. — VI. Contracts for the allocation of electrical power rights, 197; Comparison of costs of hydro-electric and steam-generated power, 200; Total financial cost to the Los Angeles area, 202. — VII. Fundamental questions. (1) Long-run economic expediency, 205; (2) Immediate economic expediency, 206; (3) Political expediency, 209; (4) The policy of federal enterprise in the power industry, 213; Conclusion, 216.

### I

THE Boulder Dam project, by passing into law, has now escaped from that mixed atmosphere of investigation, negotiation, controversy, propaganda, and intrigue wherein for so many years it eluded the critical analysis of disinterested observers. Since legislation authorizing

1. Compact presentation of the essential facts relating to the development of the Colorado River Basin is to be found in the Fall-Davis Report (Senate Document No. 142, Sixty-seventh Congress, Second Session, 1922); Colorado River Development, a compilation of documents by Mr. George W. Malone (Senate Document No. 186, Seventieth Congress, Second Session, 1929); and the Report of the Colorado River Board (House of Representatives Document No. 446, Seventieth Congress,

construction of the dam on the Colorado River has been upon the statute books for more than a year, sufficient time has elapsed to permit some considerable mulling over the records of the controversy.

It has for years been plain that the controversy over the development of the Colorado River was one of the most significant public questions with which Congress has had recently to deal. Upon it one has been wont to encounter the most diverse and violent opinions. Yet nowhere could there be found a comprehensive and trustworthy account of the interests involved and the issues at stake. This has been due to the fact that the interests touched were so numerous and conflicting and the prejudices aroused so extreme, as to elicit a clamorous avalanche of *ex parte* pleading before which one could merely retire into a position of watchful attention and reserved judgment. Even upon quiet retrospective scrutiny the issues do not become simple nor "sound public policy" self-evident, so entangled are the engineering, economic, political, and legal aspects of the project.

In its preamble the Boulder Dam project act recites

that for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy as a means of making the project herein authorized a self-supporting and financially

Second Session, 1929). The Weymouth Report in nine volumes (1924), prepared by the former director of the Reclamation Bureau, is the most complete source. It has not been printed and only a few copies are in existence. The controversial questions are developed in the published Hearings on the Swing-Johnson bill from the Sixty-seventh to the Seventieth Congress. The Department of the Interior distributes a bibliography of articles and documents relating to Colorado River development. Senate Document No. 186 contains a copy of the Boulder Dam project act and of the Colorado River Compact.

solvent undertaking, the Secretary of the Interior, subject to the terms of the Colorado River Compact hereinafter mentioned, is hereby authorized to construct, operate, and maintain a dam and incidental works in the main stream of the Colorado River at Black Canyon or Boulder Canyon adequate to create a storage reservoir of a capacity of not less than twenty million acre-feet of water and a main canal . . . located entirely within the United States connecting the Laguna Dam . . . with the Imperial and Coachella Valley in California.

Behind these innocent words there lies the non-controversial need of the Imperial Valley for protection from floods, and the following controversial issues:

1.  Which, among many plans, for utilizing the waters of the Colorado River, is to be followed?

2.  Should the pressing need for flood control be dealt with separately from the development of the river's economic potentialities?

3.  What division should be made of the waters of the river for the future use of states in the upper basin and lower basin, respectively?

4.  What division should be made between the states of California and Arizona of waters reaching the lower basin?

5.  What provision should be made for division of the river's waters between the United States and Mexico?

6.  Should the United States engage in a project the immediate benefits of which are almost exclusively confined to local areas within a single state?

7.  Ought the United States to proceed with additional reclamation projects, in the light of our present agricultural situation?

8.  Should the generation of electrical power be engaged in by the United States or turned over to other agencies?

9.  Is a high dam at Black Canyon or Boulder Canyon a feasible project, in the engineering sense?

10. Could such a dam be constructed at a reasonable cost, in the economic sense?

11. To whom would the power generated belong, or who should have priority in its purchase?

12. Has the United States a constitutional right to construct such a dam and power plant, with or without the consent of a state upon whose territory it will be located?

13. As a general matter of public policy ought the United States to enter a sphere of industry in competition with private enterprises?

14. Again as a matter of policy, ought the United States to engage in a project upon the territory of a state against the will and over the protest of that state?

While not exhaustive, the foregoing list of questions will sufficiently indicate that the economic development of the Colorado River Basin is not a subject that can be either discussed or settled in strictly economic terms. Tho one were to discuss the question merely from the angle of the immediate parties at interest, it emerges that those parties are primarily political units, and that the matter inevitably takes on a political and legal character. If one looks for its wider significance, the project appears as an episode of major importance in the process of adjusting the relations between the federal government, the state governments, municipalities, and private industry.

In the nature of the case, so many questions as have been raised above cannot be taken up in detail within the limits of a single article. No more will be attempted than to make somewhat more explicit the exact nature of the issues and to review critically the current solution.

## II

The Colorado River represents the greatest undeveloped economic resource of the Southwest. With its tributaries, it is the sole water supply of an arid or semi-arid empire of 242,000 square miles. The technical problems of utilizing its waters are set by the character of the river itself. Its waters derive primarily from melting snow and precipitation draining into tributary streams in the upper basin states of Wyoming, Colorado, Utah, and New Mexico. Passing from the mountain plateau, the waters are consolidated in the main stream which drops rapidly down a series of canyons mainly located in Arizona and on the Arizona-Nevada border. Through its lower course it meanders at a low elevation as the boundary first between California and Arizona, then between Arizona and Mexico, and finally passes into Mexican territory for its last 'one hundred miles. Through the ages its delta has been built, cone-shaped, completely across the Gulf of California, leaving to the north a depression, once part of the gulf, lying below sea level. Within this depression lies the area known as the Imperial Valley, of great fertility and now cultivated to the extent of about 450,000 acres. The valley is supplied with water from a canal taking its origin from the river within California, then crossing the border and running most of its westward course in Mexico before turning back across the border into the Imperial Valley. The concession from the Mexican government under which this canal was built requires that one half its waters be available for use on Mexican land.

The primary problem for the Imperial Valley, as for other uses of the river's water, arises out of the extreme seasonal and annual variations in its flow, which may

vary from 200,000 or more second-feet [2] in flood to as little as 2,000 at low water, and from 25,000,000 acre-feet [3] in one year to 9,000,000 in another. Tho at other times a quiet stream except for "flash" floods, the Colorado from May to July sends down a tremendous silt-laden flood. These floods annually threaten to break through on the northern side of the delta cone, from which they would pour down into the Imperial Valley and, unless stopped, inundate it completely in the course of a few years. This outcome is only prevented by a series of levees, which, because of the silting up of the bed, must be carried higher each year, and are now very near the limit of economic if not of engineering tolerance. This precarious situation of the Valley occasioned the original appeal for federal aid in controlling the waters of the Colorado. The projected solution, a flood-control dam, did not require an extremely high dam, one sufficient merely to impound enough of the flood waters to eliminate the danger to the levees.

These waters, released gradually, would make possible the irrigation of additional lands along the lower stream. Since, however, Mexico is entitled to half the waters flowing through the canal and is to the present using only one third of it, the additional water might accrue almost exclusively to Mexican lands. If, however, a canal could be constructed at a higher level along the southern border of California entirely on American soil, water could be provided for the irrigation of an additional area of from 400,000 to 500,000 acres. This is the basis for the proposed construction of the so-called all-American canal.

The further interest of California in the dam project

2. A second-foot is a volume of one cubic foot passing a given point in one second.

3. An acre-foot is a volume of water sufficient to cover one acre one foot deep, or 43,560 cubic feet.

is connected with two or three phases of the economic development of Los Angeles and its surrounding territory. The limiting physical factor upon the growth of population in the Los Angeles area is the supply of water. To meet present needs, with a city population of somewhat less than one and one fourth millions and a further million and a quarter in the surrounding territory, the city has had to supplement the local wells by building an aqueduct of 400 second-feet capacity (about 258,500,000 gallons daily) originating in the Sierra Nevada Mountains 250 miles away. For the past ten years the city has been investigating the matter of future supply, and because of limited supplies in the mountains during the dry season, opinion has in recent years crystallized upon the Colorado River as the sole adequate source. Concerning the supply needed for the immediate and more remote future, there are the most contradictory evidence and estimates. In the nature of the case, no one can tell how fast population will increase. It would appear, however, that the present supply is adequate for an increased population of one million, which will probably occur by 1940. A diversion from the river of 1,500 second-feet would meet the needs of 7,750,000 people more (at a daily per capita consumption of 120 gallons). Until needed for domestic use it can be applied to irrigation. To secure water from the river would entail the building of an aqueduct more than 250 miles in length, at a cost of perhaps $150,000,000. The aqueduct would run over low mountains, necessitating tunnelling and a pumping lift usually estimated at 1,600 feet, though the route has not yet been chosen.

If the problem of supplying the Los Angeles area with water were merely a water-supply question, it would be capable of easy solution by a small additional capacity to the projected flood-control dam and reservoir. To

pump the water over the mountains would, however, require power, something over 350,000 firm horsepower being required to pump 1,500 second-feet, or about 1,000,000 acre-feet per year. Naturally it was proposed to construct the dam in such a way as to provide the necessary power. Combining flood control, domestic water for the Los Angeles area, and the generation of power for pumping would, of course, necessitate a high dam, since the impounded waters must be sufficient to permit extensive withdrawals during the dry season and still leave sufficient "head" for generation of power. It was in response to these combined considerations that attention centered upon the district of Boulder and Black Canyons, lying on the Nevada-Arizona line, since it was these that furnished the sites farthest down the river for building a dam of the necessary height and storage capacity.

The interest of Los Angeles in such a project was not, however, limited to the matter of water supply. For many years the city has been developing a part of its own supply of electrical energy in competition with the Southern California Edison Company. It has constructed hydro-electric plants back in the mountains and along its main water aqueduct. The distributive system of the city is mainly a municipal enterprise, but, since its generative capacity is inadequate to its needs, a major fraction of its current has had to be purchased at wholesale from the Southern California Edison Company, which with its subsidiaries almost monopolizes the private power enterprise of the southern territory. For this current it has recently had to pay at the average rate of about 6½ mills per kilowatt-hour, a price much in excess of costs from the city's plants and of costs at the company's more efficient plants. Such a relatively high price has, however, been obtainable because the needs of

the area entailed recourse to the use of older high-cost plants. Seeking escape from the high prices paid for current and indeed seeking to make itself as little dependent on the company as possible, the city found the general answer in the power potentialities of the Colorado River. The explicit answer was to secure additional height to the projected dam, sufficient to generate a substantial amount of power above that needed for pumping. To meet its desires, the city must, of course, have preferential rights to this power, wherein it naturally fell foul of the desires of the Southern California Edison Company. This aspect of the power controversy may best be postponed to a later point, where the power question can be taken up as a unit.

The foregoing account will have made plain that the project for a very high dam, one of unprecedented magnitude, derives from the needs or desires of the city of Los Angeles. The economic feasibility of the project likewise has depended upon the ability of the Los Angeles area to absorb and pay for the power generated. This potential market for power has been from the start directly in the center of the Department of the Interior's attention, since it would permit flood control and reclamation development to proceed at a minimum cost to the federal government.

### III

Such a project, as it began to form, immediately and naturally underwent the scrutiny of the four states of the upper basin wherefrom the waters of the Colorado River are gathered. In these states there are now under irrigation from the tributary waters of the river approximately 1,450,000 acres. There are estimated to be an additional 2,750,000 acres potentially irrigable. Were each state permitted absolute control over the waters

within its boundaries, it would of course be a matter of indifference to these upper states what developments took place in the lower basin. They could appropriate water as it was needed, leaving the land and other interests in the south to take the risk of inadequate water to meet their needs. Since they are not granted this free utilization of the water within their borders, it becomes necessary to examine the law governing the appropriation of water from interstate streams.

In the arid-land states of the West the common-law rules of riparian rights have never obtained. Each of these states has written in its code or its constitution the alternative principle of prior appropriation. In most cases the principle is older than statehood, having arisen in custom or in territorial laws. Varying in detail from state to state, it is everywhere fundamentally the same. In brief, the principle of prior appropriation means that anyone who has established himself in the beneficial use of the waters of a stream shall be secure in his supply of water against all later appropriators, no matter what his location on the stream. What this amounts to is that appropriation may not take place upstream to the detriment of those already using the water further down. Although this principle had long been administered by state courts, the law was not at all clear as to the respective rights of states in the waters of interstate streams at the time when the Colorado River Commission began considering the allocation of water rights. An earlier case, Kansas *v.* Colorado (206 U. S. 46, 1906) had pointed in the direction of a principle of "equitable division." In 1922, however, in the case of Wyoming *v.* Colorado (259 U. S. 419, 1922), the Supreme Court established the principle of prior appropriation as between states. That is to say, water users in California or Arizona were protected against developments in Colo-

rado or Utah which would deprive the former of their supply. In effect, state lines were abolished so far as rights to the beneficial use of water were concerned.

Many water rights in the Imperial Valley antedate those existing in the upper-basin states. Since at low water the lower river supplies barely enough water to meet the present needs of the Valley, further withdrawals of water above threatened to lead to extensive and complicated litigation. The states of the upper basin were therefore interested in the provision of water storage in such way as to meet the needs of the lower basin without impairing their own water supply. On the other hand, a storage project of this kind created apprehension in the upper states. One certain effect would be the growth of irrigation projects in the south. Not only are there the Imperial Valley and adjacent projects, and the Mexican projects, but also projects in Arizona of as yet undetermined area. Appropriation of water for domestic use and power would also establish further rights. If the stored water were fully used, the rights created might be of such magnitude as to continue to deprive the upper states of water needed for their future development.

Two primary results flowed from the apprehensions raised by the storage project. One was the making of more accurate scientific studies of the flow of the Colorado River to determine its adequacy for meeting the ultimate demands upon it, together with a fuller survey of the amount of potentially irrigable lands within the basin of the river. The other was the setting up of the Colorado River Commission, to determine some equitable permanent allocation of the waters of the river by agreement among the states, in lieu of the unchecked operation of the principle of prior appropriation. The Commission consisted of an official representative of

each of the seven states having territory within the river basin, presided over by Herbert Hoover, then Secretary of Commerce. Any project for development on the lower Colorado River depended for its passage through Congress upon a successful outcome to the deliberations of this Commission.

It will be impossible here to follow the negotiations which resulted in the Colorado River Compact.[4] The primary feature of the compact is the right of the upper basin states to appropriate in perpetuity 7,500,000 acre-feet of water each year, subject to the condition that they permit 75,000,000 acre-feet in each consecutive ten years to pass to the lower basin. Another 1,000,000 acre-feet per year is reserved for the lower basin, if available. Since the amount of water allotted them is in excess of estimates of their future needs, the upper-basin states have willingly ratified it. With the compact in force they are in a position to be neutral on the Boulder Dam project, or, so far as their representatives in Congress are concerned, to base their position on other grounds than that of protection of water rights. Between the upper-basin states there has arisen no dispute concerning the allotment of the total annual supply, since each has its own system of tributary streams capable of meeting its own needs.

Nevada, in the lower basin, has little potential capacity to use water from the river. Between Arizona and California there is, however, a source of disagreement. The present project increases the uses of water primarily for the benefit of California. As between California and Arizona, the principle of prior appropriation continues in force. The irrigation of 900,000 acres in California

4. The history and provisions of the compact are fully discussed in "The Colorado River Compact" by R. L. Olson, published (1926) by the author and distributed by Southwest Research, Los Angeles.

would require about 3,600,000 acre-feet of water annually, and a diversion of 1,500 second-feet for domestic use would total about 1,000,000 acre-feet per year. Assuming these rights to be established, adding possible concessions to Mexico and water held back for power purposes, the amount remaining for possible future use in Arizona is liable in the end, when development is complete in the upper basin, to be small, especially in dry years. Any considerable use of the waters of the Colorado in Arizona is going to be very remote in time, since most of her irrigable lands lie in such a position as to necessitate expensive pumping. Many of these lands, moreover, lie in locations not served by the Boulder Dam project, and require the development of the river on other lines than those now being pursued. On mere immediate considerations the compact would be a matter of indifference to Arizona. But as something which underlies the dam project, which in turn undercuts her future development, she is unwilling to ratify the compact, except upon promise of an assured share of water larger than California is willing to grant and upon assurance of royalty returns from power generated at the dam.

Arizona's further opposition to the dam project is predicated upon the assumption that private power companies would be willing to pay well for franchise rights to develop power sites on Arizona territory. Such developments would of course also furnish a constant source of revenue from taxation. Under federal development as authorized in the act there is no guarantee of any revenue to the state, tho there is an allocation of certain contigent revenues. In lieu of franchise and tax revenues Arizona, as well as Nevada, has persistently claimed the right to royalties or to title to a substantial share of the power generated at the dam. By reason of

seeing her interest in terms of development by private companies, Arizona has become anathema both to California interests and to all who see some peculiar virtue in federal exploitation of power resources.

In an attempt to overcome Arizona's fears as to water, the Boulder Dam project act authorizes the lower-basin states to enter into a compact reserving for Arizona's use 2,800,000 acre-feet of the average 7,500,000 allotted to the lower basin, plus one half of all surplus waters, plus all waters of the Gila River, a southern tributary. On the other hand, the act was drawn to become effective when the compact had been signed by six states, and that is the basis upon which it has become operative. This feature of the bill raises a serious constitutional question concerning the right of the federal government to develop works and to appropriate water on Arizona's soil without her consent. The question, too complex for discussion here, promises to lead to litigation which may indefinitely obstruct actual operations under the act — unless, as her opponents are inclined to allege, her obstructionist tactics are merely part of an avaricious bargaining program to be dropped when the best possible terms have been reached.

It has seemed desirable to state at such length the position of Arizona, first, because it has been and continues to be the really serious threat to the consummation of the project; second, because it epitomizes the bargaining for state advantage characteristic of all the states involved; third, because it raises a serious question of future policy for the federal government in its dealing with regional associations; and, finally, because it furnishes the text for certain general economic considerations to be commented upon at a later point.

## IV

Concerning the engineering feasibility of the Boulder Dam, there seems to be very nearly an affirmative concensus. Upon the cost estimates, however, there is much difference of opinion. In view of the uncertainties attending the diversion of the Colorado's waters at full flood during the construction period, it would appear impossible to forecast the cost with any accuracy. The original estimate, worked out by the Reclamation Bureau, was $125,000,000, to include dam, power plant, canal, and interest during construction. Upon review by an expert board [5] in 1928 this figure was increased to allow for additional factors of safety and to correct possible underestimation. The expenditure of $165,000,000 authorized by the act is based upon the following estimates:

| | |
|---|---:|
| Dam and reservoir......................... | $70,600,000 |
| 1,000,000 horsepower development............ | 38,200,000 |
| All-American canal......................... | 38,500,000 |
| Interest on above during construction......... | 17,700,000 |
| Total............................... | 165,000,000 |
| Canal extension to Coachella Valley.......... | 11,000,000 |
| | $176,000,000 |

Assuming the relative accuracy of these figures, the actual plans now being drawn up will entail a larger expenditure, since the projected dam and power development are of greater magnitude than those upon which the estimate was based. The plans now tentatively drawn up call for a dam over 700 feet high rising 582 feet above low water level, creating an artificial lake 115

5. The appointment of the Colorado River Board, composed of five engineers, followed a speech of Senator Smoot delivered in the Senate April 20 and May 1, 1928, containing an impressive denial of both the engineering and economic feasibility of the project.

miles long with an area of 220 square miles and a capac-
ity of 30,500,000 acre-feet, or about two years' average
flow of the river.  A power installation of 1,200,000
horsepower is planned, which at an estimated load factor
of 55 will make available 660,000 firm or constant horse-
power, creating 4,240,000,000 kilowatt-hours of energy
per year.  The capacity of the reservoir and the power
potentialities of the dam will decline regularly through
the deposit of silt, which is carried down the river to the
extent of about 110,000 acre-feet per year.  This in fifty
years would take up more than one sixth of the capacity
of the reservoir.  The catching of silt at the dam is an
important item in facilitating irrigation and making
water available for domestic use.  Excessive silting of
the reservoir, it is anticipated, will be avoided by the
construction at some later time of a dam further up-
stream.

## V

Turning more in detail to the provisions of the act, one
may classify the more important items under two major
headings which to some extent overlap: first, administra-
tive instruction to the Secretary of the Interior and
definition of the Secretary's power and, second, the pro-
visions for making the project "a self-supporting and
financially solvent undertaking."

Under the first of these headings the striking fact is
the degree of discretionary power given the Secretary of
the Interior, who is to act in all matters for the United
States.  We may work through the act to discover the
extent of his authority.

1.  He is "authorized," but not directed, to construct,
operate, and maintain a dam and incidental structures
at Boulder Canyon *or* Black Canyon.

2.  He is authorized to construct the canal "if deemed

necessary or advisable by him upon engineering or economic considerations."

3. Before construction may be begun, the Secretary shall make provision for revenues by contract adequate in his judgment to insure payment of expenses of operation and maintenance and repayment of the capital cost plus interest (with certain exceptions) within fifty years of the completion of the works.

4. He is authorized "under such general regulations as he may prescribe" to contract for the storage and delivery of water, and for generation of electrical energy and delivery at the switchboard to states, municipal corporations, political subdivisions (water districts, etc.), and private corporations.

5. Contracts for electrical energy are to be made "with a view to obtaining reasonable returns" and are to be readjusted at intervals upon request of either party "as the Secretary of the Interior may find to be justified by competitive conditions at distributive points."

6. In case of conflicting applications for electrical energy, they shall be resolved by the Secretary "with due regard to the public interest, and in conformity with the policy expressed in the Federal Water Power Act," with preference to states for use within the state.

7. Contracts may be for "the use of water and necessary privileges for the generation and distribution of hydro-electric energy," *or* "for the sale and delivery of electrical energy."

Again, the Secretary may (a) "control, manage, and operate" the generating plant or (b) "enter into contracts of lease for the use of the water for the generation of electrical energy," or (c) "enter into contracts of lease of a unit or units of any government-built plant, with right to generate electrical energy."

8. The Secretary is to prescribe rules and regulations with respect to maintenance, accounting, rates, valuation for rate-making, and various other matters, conforming with the requirement of the Federal Water Power Act "so far as applicable."

9. He may, "in his discretion," transfer title of the canal to the agencies having a beneficial interest therein, when repayment is completed. (He may not transfer title to the electrical generating plant, tho one cannot tell whether this applies to movable equipment.)

There are numerous other provisions defining the Secretary's duties, but the above will indicate sufficiently the extent and discretionary nature of his powers. For the most part the discretion granted him does no more than provide for the necessary administrative flexibility. On the other hand, there are a few very wide powers. It is, for example, left to his discretion whether the all-American canal shall be constructed. Again, he is to determine the question of policy, whether the government is itself to generate power, or whether the generative rights are to be leased. *Per contra*, he is rather narrowly restricted as to terms of sale or lease, being required to deal with all contractors on similar terms, and being restricted by the provisions as to "reasonable returns" and "competitive conditions."

The financial provisions of the act may be briefly described as follows. A "Colorado River Dam fund" is established, under the control of the Secretary of the Interior. To this fund the Secretary of the Treasury is to transfer funds as called for by the Secretary of the Interior, to the extent of current appropriations. Interest at 4 per cent on all sums advanced during each year is to be paid back to the Treasury annually, with the following exceptions: that interest is not payable upon the cost of the canal; and that if the fund is temporarily

inadequate to meet interest payments, they may, at the
discretion of the Secretary of the Treasury, be deferred,
such deferred amounts becoming interest-bearing. (On
this point, the act seems contradictory, since it states
that all expenditures from the fund shall be made "under
the direction of the Secretary of the Interior," but
authorizes the Secretary of the Treasury to "charge the
fund" for interest.) At the end of each fiscal year the
Secretary of the Interior is to certify to the amount
in the fund in excess of "the amount necessary for con-
struction, operation, maintenance, and interest," which
excess is charged the fund as repayment and credited
to the general Treasury's miscellaneous receipts.

Contracts must be in hand before construction opera-
tions begin, sufficient to repay the Treasury the total
estimated cost with interest within fifty years of com-
pletion of the project, with two exceptions. The first is
that the funds for the canal are not interest-bearing,
mere capital cost being levied against the lands bene-
fited and payable over forty years as provided in the
reclamation law. The second exception is that, for
$25,000,000 of the cost of the dam specifically allocated
to flood control, full reimbursement is not required
within fifty years. Actually, then, the contracts let are
*required* only to be sufficient for the amortization over
fifty years of a capital sum less than the estimates by
that amount. The most recent official estimate of the
cost of the project (excluding the canal) is $125,392,000,
or slightly less than the earlier estimate included in a
preceding table. Of this amount $17,717,000,[6] repre-
senting the cost of equipping the power plants, is to be
repaid by the lessees under the power contracts (to be

6. Estimate by the Bureau of Reclamation. A somewhat larger
estimate of $20,000,000 for a one million horsepower installation, is
supplied by the Bureau of Power and Light, city of Los Angeles.

noticed later), which leaves $107,675,000 to be repaid out of power and water revenues. To amortize this amount bearing interest at 4 per cent on the unpaid balance would require an annual revenue of just over $5,000,000 above operating costs. The latter are estimated at $200,000, not to include the operating costs of the power plant which are to be assumed by the lessees.

To illustrate the provisions of the act it is necessary, however, to make an amortization calculation upon a capital sum smaller by $25,000,000 than that given above, since it is provided that the sum allocated to flood relief is to be reimbursed out of 62½ per cent of the revenues in excess of those necessary to amortize the smaller amount, and, after the fifty-year amortization period is completed, out of 62½ per cent of the net revenue. The other 37½ per cent of the surplus revenue during the amortization period is to be divided equally between the states of Arizona and Nevada, presumably in lieu of taxes which they might have collected from power development by a private company. No provision is made for their sharing in revenues after amortization is completed, the act merely specifying that thereafter revenues "shall be kept in a separate fund to be expended within the Colorado River Basin as may hereafter be prescribed by Congress."

Making the calculation on the above basis, one finds that a revenue of $3,848,000 is required to amortize $82,675,000. Under the completed leases of power rights the estimated annual revenue is $7,216,000 and additional revenue of $247,000 is anticipated from water storage. Assuming the correctness of the above estimates, there would remain a balance of $3,368,000 available from power revenues alone for amortizing the $25,000,000 and for payments to Arizona and Nevada. Of this $2,105,000 would go to the former purpose and

$631,500 would go to each of the states. Such calcula-
tions indicate the grounds for believing that the project
will be self-liquidating, even though the estimates err
materially on the side of optimism.[7]

## VI

Whether the federal government should enter directly
into the power business or not, the act, as we have seen,
does not determine. Regarding the power generated
strictly as a source of income, it leaves to the discretion
of the Secretary of the Interior whether he shall operate
the power plant, or lease it, or lease the use of water for
operating it. The plan actually adopted by the Secre-
tary is the third of the alternatives mentioned. The gen-
eral plan, as drawn up in a contract with the Metro-
politan Water District of Southern California [8] and a
joint contract with the city of Los Angeles and the
Southern California Edison Company,[9] is as follows.
All water rights for the generation of power are leased to
the city and the company. The firm energy generated [1]
is allotted: 18 per cent each to Arizona and Nevada for
use in those states; 36 per cent to the Metropolitan
Water District for pumping water through the aque-
duct; 13 per cent to the city of Los Angeles; 6 per cent
to eleven Southern California municipalities; and 9 per
cent to the Southern California Edison Company and
three other private companies. All power allocated to

7. The estimates of costs and revenues are taken from data supplied
by the Bureau of Reclamation. The amortization calculations are the
work of the present writer.
8. The Metropolitan Water District includes Los Angeles and ten
other municipalities.
9. Copies of these contracts are to be found in the Congressional
Record for April 29, 1930, at pp. 8250 and 8255, respectively.
1. Firm energy is defined as 4,240,000,000 kilowatt-hours in the first
year of operation, less a subtraction of 8,766,000 kilowatt-hours for each
subsequent year.

political units, or 91 per cent of the total, is to be generated in the plant operated by the city, the remainder by the company.

While the generating operations thus rest primarily with a public agency, the actual marketing of the power will probably be in quite different proportions. This appears when one examines to whom the power goes when not used by the initial allottees. Any power allocated to states (36%) not used by them is available first to the Metropolitan Water District, and, failing of use by it, is to be taken one half each by the city and the company. Power allocated to municipalities not taken by them goes to the city. That allocated to other companies not taken by them goes to the company. Secondary energy,[2] which is unallocated, may first be claimed by the Water District, and failing of use by it goes in equal shares to the city and the company. Firm energy allocated to the Water District but not needed for pumping may be taken half-and-half by the city and the company. There are other complicated provisions for the transference of power allocations from one agency to another which need not be reviewed. The allocations to Nevada and Arizona are for the time being an empty gesture, since there is no market for more than a tiny fraction of the amount named. For a good many years the Water District will need much less than the amount allocated to it. Plainly, then, almost all the power will have to be marketed in the Los Angeles area. A hypothetical illustration of the provisions for transference of power may be made on the assumption that Arizona and Nevada use only one sixth of their allocated power, and the Water District only one half. In that case 33 per cent of the power generated would be marketed by

2. Secondary energy is defined as all energy generated in excess of the firm energy as defined.

the company except for the small amount allocated to the other companies, and 37 per cent by the city, the balance going in percentages of 6, 6, and 18 respectively to the states, the municipalities, and the Water District. If the Water District used all its power, the city's percentage would be 28 and the company's 24. If secondary power were generated, the company's percentage would be relatively larger.

Under the contracts, the government is to pay for the generating equipment, amounting to $17,000,000 or more, but is to be reimbursed by the city and company for their respective shares in ten annual payments, title however remaining in the United States. This will have the effect of reducing the capital amount to be amortized out of income over the fifty-year period. The contract price for the use of water is 1.63 mills per kilowatt-hour of firm energy generated and $\frac{1}{2}$ mill for secondary energy, estimated to yield an average annual revenue of $6,550,000 and $666,000, respectively. Since the lessees are to pay for the generating equipment and to meet operating and maintenance expenses, the figure for firm power is something less than the cost of power at the dam. By exactly what process of calculation and compromise it was arrived at one cannot say, but it has the two necessary properties that, multiplied by the estimated power output, it indicates a sufficient revenue to the government, and, added to the costs of generation and transmission, it permits a price low enough to compete in the Los Angeles market.

Contractually, there is a binding obligation on the part of the company and the city to take 64 per cent of the firm power generated if it is not taken by other allottees, and on the part of Metropolitan Water District to take 36 per cent. Other allottees are under no contractual obligation. They have the privilege of tak-

ing their shares if they wish them. The government's financial protection thus is that it has firm contracts for the sale of power rights estimated to produce a revenue of something over $7,000,000. The government's interest would now seem to center almost exclusively in the cost of the project, and the adequacy of that amount of income for amortizing the cost. All other risks appear to have been assumed by the other contracting parties. The answer is, however, not quite so simple, since the act provides for a revision of rates at the end of fifteen years and each ten years thereafter, "as the Secretary of the Interior may find to be justified by competitive conditions at distributing points or competitive centers." Since more than half the initial fifteen years will elapse in construction and absorption periods before the whole capacity is utilized, the estimated revenues are really only guaranteed for a period of five or six years. The self-liquidating character of t e project therefore turns not merely upon its problematical cost, but upon the even more problematical future costs of steam-generated power in the Los Angeles area.

The steam generating costs have, however, an interest independent of the government's finances. They institute comparisons which bear upon the economic expediency of the whole project. Estimates of the cost of Boulder Dam power delivered in Los Angeles (including auxiliary steam "stand-by" plant expenses) tend to center around 4 to $4\frac{1}{2}$ mills per kilowatt-hour. Data furnished by the Southern California Edison Company indicate that in its most efficient plants at normal load factor the cost is about $3\frac{1}{2}$ mills; that its average cost for all plants is about 5 mills; and that the average price of its sales to the city of Los Angeles is about $6\frac{1}{2}$ mills. If in the most modern steam plants power can be generated at a lower cost than hydro-electric energy can be

provided, the question arises as to why power should be generated at the Colorado River at all. Why not build new steam plants instead?

There are two aspects to this matter, one having to do with the relations between the city and the company, the other relating to wider considerations of economic and social expediency.

In the first place, the city will for the time being not have to purchase power from the company. It will get Boulder Dam power at cost, and the prospective cost is from 2 to $2\frac{1}{2}$ mills cheaper on the average than it now buys current from the company. It is the company which is expanding steam generation. The city would become increasingly dependent on it for power, and could not expect for a long time to come, if ever, to secure as low an average price as 4 mills. Moreover, the estimated cost of Boulder Dam power delivered in Los Angeles includes provision for the amortization of the cost of the dam, power plant, and transmission lines. Once the amortization is complete, the costs will be only those of operation and maintenance, permitting power to be delivered at a cost lower than any conceivable cost of power from private steam plants. Finally, while one reason for the present low cost of steam-generated power is the extraordinary increase in mechanical efficiency, another is the very low price of fuel. The Southern California plants are equipped to use either coal, oil, or natural gas. At present they are using natural gas at a cost equal to the use of oil at sixty cents a barrel. How long such bargain rates are apt to continue is indeterminable, but it is commonly supposed that oil at from one dollar to a dollar and a quarter is a proper basis for computing fuel costs for the future. At such a fuel cost the minimum power cost would be very close to that of Boulder Dam power. On

such long-run considerations as these, and in the light of its experiment in the municipal distribution of power, the city of Los Angeles takes little interest in the argument that it is uneconomical to bring Colorado River power to the city. As the city is paying the piper, its position is enlightening, even convincing.

The second aspect of the cases raises wider questions: An incredibly large amount of natural gas is going to waste in Southern California, to be had almost for the asking, and capable of being converted into $3\frac{1}{2}$ mill power. Is there any economic sense in expending scores of millions of dollars to get power at 4 mills? Part of the answer lies in the elements of uncertainty mentioned in the previous paragraph. Another part lies in the fact that the city, as a customer of the company, will not get the lower rate. But the final and clinching part is that the limiting factor for the use of the natural gas is the lack of a market for the electricity. To create a larger market requires an increase in population. Any great increase in population depends upon increased water supply. The problem of water suggests recourse to the Colorado River and in turn entails the construction of generating facilities for pumping. The production of excess power for sale in the Los Angeles market is merely the tale of the kite, secured by a little extra height to a dam already required for other purposes. This power is a mere item in the competition of private and municipal power-producing and distributing agencies. But the dam project as a whole is designed to increase the population, industries, wealth, and land values of Southern California beyond all previous dreams — even of Californians.

The foregoing account permits the financial aspect of the project, from the government's point of view, to be presented in very simple terms. Excluding the canal,

the out-of-pocket cost in the most recent estimates is a little more than $126,000,000. The annual revenues, largely provided for by existing contracts, should be in excess of $7,000,000. This is an amount sufficient to meet expenses and amortize the cost in fifty years. The revenues are, however, subject to uncertainty due to possible future revision of contracts. On the other hand, in addition to paying for power, the contracting parties are to reduce the capital amount by $17,000,000 or more within ten years. The charge of $25,000,000 for flood relief is not obligatory upon the revenues. Since this amount would in any case probably have to be expended for that purpose alone, it may properly be isolated from calculations as to the economic character of power generation at the dam. Actual construction costs may thus exceed the estimates by many millions without endangering the operation of the financial plan and without reflecting upon its economic expediency.

From the point of view of the Los Angeles area, the costs of the project are of course of much greater magnitude. Estimates of the cost of the water aqueduct run from $150,000,000 to $200,000,000. This will have to be met by bond issues of the Metropolitan Water District, backed by the credit of Los Angeles and the ten other cities which are its constituent members. The cost of power transmission lines is estimated at around $50,-000,000, partly to be borne by the Southern California Edison Company, but mainly by Los Angeles. Including the cost of the dam for which power users will ultimately pay, Southern California agencies, and primarily the city of Los Angeles, are assuming an obligation of perhaps $350,000,000. Additional expenditure for local distributing systems will probably increase the total to in excess of $500,000,000. To Southern California the

annual payment for Boulder Dam power is thus merely
an item in financial obligations of much greater magni-
tude.  Consequently, the territory has undergone a proc-
ess of economic scrutiny and of economic forecasting in
a degree never before applied to any American com-
munity.  This is typified by the survey made by the
Bureau of Power and Light of the Department of Water
and Power of Los Angeles.  While it is impossible here
to summarize the findings of this and other surveys, the
results were to make the financial obligations involved
seem economically feasible.  The security of the funds
advanced by the United States for the building of
Boulder Dam is thus dependent upon the solvency of
California municipalities, which in turn will rest upon
the problematical growth of population and wealth dur-
ing the coming generation.  The expenditures planned
are of a sort to stimulate such growth directly, and the
possibility of insolvency seems remote.  In view of the
very general tendency to regard the Boulder Dam pro-
ject as a raid by Southern California upon the federal
Treasury, it is worth pointing out that fundamentally the
Treasury is acting as banker in a somewhat speculative
enterprise.  The United States holds no note for the
principal, but it holds contracts for annuity payments to
retire it.  If the plan works out in its entirety, the United
States stands to get $25,000,000 of flood relief for noth-
ing, not to mention the salvaging of valuable lands.
That, after all, represents a fairly large commission for
the banker.

The theory of a "raid upon the Treasury" deserves
a little further examination.  It should not be forgotten
that both the city of Los Angeles and the Southern Cali-
fornia Edison Company filed upon Colorado River
power sites under the Federal Water Power Act.  The
government was, however, unwilling to entertain such

applications, because of the belief that the complex of factors — interstate and international relations, flood relief, and reclamation — required direct federal development of the river. Refusing to permit other agencies to develop the river, the government could hardly be expected to adopt a perpetual attitude of dog in the manger. To sterilize a potentially productive agency would be a unique direction for national economic policy to take. The productive powers of the Colorado River were bound to be put to use eventually, and since the federal government insists upon being the agent of development, it is ill-considered to speak of the areas benefited as raiding the Treasury. That much of the gain from the present development will accrue to the holders of Southern California real estate is hardly to be held against the project as such. Such a result is implicit in the nature of our institution of private property and is only deplorable in the same sense and to the same degree as all the other innumerable instances of "something for nothing" in our current scheme of the distribution of wealth.

## VII

The really fundamental questions about the present plan of development are four in number. First, is it economically expedient in the wide sense that it harmonizes with a more complete plan for the utilization of the river's waters? Second, is it economically expedient in the narrow and immediate sense that the wealth to be created promises to justify the expense entailed? Third, is it politically expedient in the sense that it has due regard for the interests and relations of all the political units affected? And, fourth, is it expedient in terms of public policy in its choice of agents for achieving the ends sought?

Concerning the first of these questions it must be said that a great variety of plans for ultimate development have been outlined, and that the present plan harmonizes with some of them and not with others. The common feature of those among the plans with which it does not harmonize is that they are drawn to permit a future larger diversion of water on to Arizona lands. Presumably the strict economic test should be applied as tho there were no state lines, the question being how the water shall be used to create the greatest amount of wealth in relation to the cost of development. The present plan does not interfere with future development of other power sites, and it does provide water for the more fertile contiguous lands and those to be reached with the least expense. This seems to require that the plans designed more for Arizona's benefit be looked at more from the angle of her proprietary rights than from that of undiluted economic expediency. Other aspects of the long-run considerations are of a rather intangible character. For example, would it be better that Arizona should in the future have a larger rural population than that Southern California should have a larger urban population? There are no yardsticks for measuring such incommensurable elements of social welfare, and answers must run in terms either of prejudice or of self-interest. Apart from such matters and from Arizona's rights, it may be said with some assurance that the present plan is not at odds with plans for the future economical utilization of the river's waters.

The second question relating to immediate expediency divides into two parts having to do, respectively, with the dam and power project and the all-American canal project. If by expediency no more be meant than that a project be self-supporting, the earlier statement of fact and financial estimates appears to give an affirmative

answer upon the first part of the question. The element of uncertainty is the fallibility of the estimates. Assuming their reliability, any other answer would be astonishing. It is taken as a matter of course that municipalities should plan for their future development. No one would criticize New York City for providing an adequate water supply. The only unique feature of the present plan is that the federal government is a party to it. But that, as was shown, is because the government insists upon being a party to it, a significant political fact but not one which has any direct bearing upon economic expediency.

The canal project raises a question of a different order. Shall the government at this time and in the light of our present agricultural situation proceed with the policy of reclamation of arid lands? The almost instinctive answer is "No." That answer, however, deserves examination, general and particular. Would it be the same if the question were whether a new steel mill should not be built because an old mill was losing money? Would it be contended that the state of Iowa should not have been settled because it necessitated the abandonment of Atlantic seaboard farms? It has never been the dictate of economic expediency that no new economic agent should be introduced because it would replace a less efficient or less productive agent. The present case is differentiated from the illustrations in that it involves financing by the federal government. But it also anticipates that the project should be self-liquidating, placing the treasury again simply in the rôle of banker. It is perhaps as near as one can get to an answer to say that, if the project does not involve a subsidy, there would be a fairly strong economic argument in its favor. It is, at the least, not opposed to the current economic common-sense to suppose that the self-supporting utilization of

superior economic agents adds to the wealth of the country.

One might lend due weight to such considerations and still think it untimely to pursue a policy likely to affect established farmers adversely. It may be interesting to notice that the total amount of new land subject to irrigation in and around the Imperial Valley, about 450,000 acres, is equal in area only to a modest middle-western county less than twenty-seven miles square. It could have only an infinitesimal effect upon the agricultural situation. Again, it is peculiarly adapted to the production of small produce and would not compete with lands producing staple crops. Finally, its development is ten to twenty years distant, its market would be partly the increased urban population of Southern California, and its products would come into eastern markets mainly at times of the year when they are not locally supplied with fresh produce. In short, its development has almost no discoverable relationship to present problems of agricultural depression.

If the dam is built nothing can prevent the stored waters, as released, from becoming available for irrigation. If they are not used in the United States they will be available for use in Mexico. The strongest economic argument against the canal is that the waters could in Mexico be put upon fertile lands at much smaller expense. It would be difficult to prove that the benefits accruing, even to the United States, would be smaller, altho the direct result would not be the creation of taxable wealth for the state of California. The Mexican lands are mainly owned by American citizens, the labor supply would not be appreciably different, the crops would be marketed in the United States. There might be some difference in the nature of the crops, since there is a tendency toward cotton culture across the border.

The social situation would differ, as the Mexican lands are farmed in very large units, mainly under absentee ownership. One finds in the Congressional hearings no argument for the Mexican lands. But if the topic to be discussed is the economical utilization of the waters of the Colorado River, it is perhaps as relevant to abolish national as state boundaries. No interested party is going to present such considerations, nor is it likely that the Secretary of the Interior in exercising his discretion as to the economic advisability of constructing the canal will pause very long over them. Yet they are perhaps the crux of the matter. Assuming, however, that the question is to be answered on lines of "the American System," and not by cosmopolitan lights, one may perhaps say that the test of economic expediency will be the ability of the lands benefited to support the expense of constructing the canal. On that point the evidence appears at present to be inconclusive.

When one turns to the third primary question, that of political expediency, it is seen to revolve primarily about the attitude of Arizona. The other interested states have, through the Colorado River Compact and the allocation of benefits, been substantially satisfied. Nevada does not like the power provisions since they promise to afford her little revenue, but she has acquiesced, mainly because of benefits to her during the period of construction. In a regional project of this character, it is, however, disturbing to have a serious sense of injustice even in one state. The atmosphere created is not that of coöperation, but one of rather heavy-handed federal coercion. It is most difficult to arrive at any opinion concerning the justice of Arizona's claims. On grounds of political equity they are strong. It is, indeed, doubtful whether the basin of the Colorado River ought to be uneconomically developed merely in

order to satisfy the selfish desires of a single political unit.  On the other hand, the Colorado River Compact is predicated, not upon a plan for the most economical development of the river, but upon the necessity of satisfying the selfish desires of the other states.  The only difference between their position and Arizona's is that they got what they wanted.  To see her interests made secondary in the development of the resource to which she had looked as her great source of future potential wealth and of public revenue is not a blow which she might be expected to accept supinely.  Failure to assure to Arizona and Nevada some certain revenue from the generation of power may well be regarded as both unjust and unpolitic.

Moreover, states as political units have their rights, quite apart from economic considerations, and it is problematical whether the federal government is not encroaching upon certain constitutional rights.  The respective rights of federal and state governments in interstate streams like the Colorado have never been accurately defined.  The legal issues are far too complex for review here.  They turn upon whether the Colorado River is, in law, a navigable river or not; whether the federal public lands bordering the river have merely the riparian rights of private owners; and whether, if the river is navigable, the federal government's power to develop it is confined to the sole end of improving navigation.[3]  The strength of Arizona's case appears to be undermined by the terms of the enabling act under which she achieved statehood, whereunder the United States made extensive reservations with respect to the control of lands adapted to the generation of electrical

3. All the elements of the legal controversy may be found in the hearings on H. R. 5773, Seventieth Congress, First Session, pp. 596–637. Government Printing Office, 1928.

energy. The opinion of a layman is, however, useless in
a question over which the lawyers disagree so whole-
heartedly. In any case, if Arizona should resort to litiga-
tion, the spirit of John Marshall is probably sufficiently
abroad in the land to cause judicial sanction to federal
invasion of Arizona's alleged rights. The whole situation
illustrates a difficulty inherent in regional projects, the
problem of compromising general economic expediency
with the particularistic interests of the component po-
litical units. Possibly in such projects the desirable
method of unanimous coöperation and extra-legal agree-
ment is too Utopian to be hoped for. Certainly a strong
case can be made for the view that, within legal limits, a
little rough-shod federal coercion is the appointed agent
of economic progress.

A further political aspect of Boulder Dam has to do
with the international situation. When the dam is com-
pleted some of the stored waters are going to run down
into Mexican territory. Part of them will, unquestion-
ably, find their way on to Mexican lands. In the course
of time, however, as the American lands in the Colorado
River Basin are brought under cultivation, a point will
be reached where further diversion will take water away
from Mexican lands already under cultivation. There is
no international law of prior appropriation to prevent
the complete cutting off of Mexico's supply of water.
There are, however, considerations of international
comity which are liable to prevent any such consumma-
tion. The Colorado River Compact provides that any
allotment of water to Mexico shall be deducted equally
from the allotments to the upper and lower basins.
Since before this exigency is liable to arise California will
probably have appropriated most of her water, Arizona
sees a further possible blow to her future prospects from
this angle.

While the division of water between the United States and Mexico has not entered the phase of diplomatic negotiations, there is in existence an International Water Commission the members of which were appointed by the respective governments to study the problem and report upon it. The report of the American Section of this commission [4] reveals that the Mexican members claim the right to 3,600,000 acre-feet of water annually for use on 1,500,000 acres of irrigable land tributary to the river. The American members recommend an annual allotment of 750,000 acre-feet, which is the greatest amount delivered to Mexican irrigators in any one year in the past. In the absence of any agreement in principle upon the division of water, they recommend that the United States government should state this publicly as its official position. Any additional waters made available by the dam, being the result of American enterprise, are to be reserved in full for use in the United States. There is a legalistic plausibility about the suggestion, but that the government should proceed in just that manner seems undesirable. At an earlier point it was suggested that such a policy might possibly be accounted poor economy. It would, however, probably be mere pedantry to suppose that the government will negotiate in any other terms than the attempt to protect fully the "national interest." Perhaps that is the correct attitude to take for pursuing the economic advantage of the country. In any case, the present split in the commission is of so serious a character that compromise will be difficult, and the dictates of equity or of comity are not clear. This issue seems destined to take its place as one more count in the bad feeling between the two countries.

4. This report is published as House Document No. 359, Seventy-first Congress, Second Session, 1930.

The final question of primary importance is concerned with the proper agencies for achieving the ends in view. Where protection from floods is required on interstate streams, no one questions the propriety of federal intervention. Whatever the merits of reclamation as a policy, if it is to be pursued on public lands with water from interstate streams, few have questioned the propriety of federal development of the source of water supply. The arguments against the expenditure of funds on the all-American canal have had nothing to do with the fact that they will be government funds, but were concerned with the wisdom of reclamation or with the justice of the division of waters between states. There has been relatively little opposition to the project of Los Angeles for a water supply in so far as water alone was concerned, and it has been limited to Arizona's alternative claims for the water. In connection, however, with the power aspect of the dam project there arose a clamorous controversy the sounds of which must have reached to high heaven. This nation-wide debate has proceeded between the same parties and upon the same grounds as that over the disposition of Muscle Shoals. Boulder Dam provided opportunity, however, for greater versality in argument, since at each stage three agencies were involved, the United States government, the city of Los Angeles, and the Southern California Edison Company. If the government were not to build a power dam, the city and the company were rivals for the privilege. If the government were merely to build a dam, they were rivals for the privilege of installing a power plant. If the government were to install the plant, they were rivals for leasing it. And if the government were to run it, they were rivals for purchasing the power.

It is not difficult to see why supreme importance has

been attached to this question, both by electrical utility companies and by proponents of public ownership of utilities throughout the country. There has seemed little likelihood that Congress would set forth upon a positive policy of federal exploitation of water-power resources. But Muscle Shoals and Boulder Dam have introduced the possibility of federal enterprise as an incidental feature arising out of a different order of project. Particularly in the case of Boulder Dam, the power feature added itself naturally to the project as a financial appendage of advantage to the Treasury. The project furnished so strategic an opportunity to propel the federal government into the power business, in the absence of any settled policy to that end, that the proponents of public enterprise in that field of industry have concentrated upon support of the project with quite unexampled zeal. Their efforts to make the power aspect a public enterprise, involving division of functions between the government and the city of Los Angeles, have been assisted by the attitude of California's representatives in Congress, presumably because the city was a more important political force than the Southern California Edison Company.

The zeal of the private power interests either to get private control over power developments or to kill the project has been equally great. The public propaganda, tho at one period directed toward proving the engineering and economic infeasibility of the project, for the most part centered upon the basic American prejudice against public enterprise. What methods of private pressure were used is unknown. One's informants hint at corruption and coercion, but are unable to produce anything but suspicions. The importance of the issue is that power, generated by a public agency and marketed by a public agency in the Los Angeles area,

will apply the acid test of economy, efficiency, and cheapness to a privately operated company, and supply to the country at large a volume of experience which may prove indefinitely fruitful and influential in the future. It is exactly this test which power companies throughout the country seem most concerned to avoid. They would prefer to assume the inefficiency of public enterprise rather than to prove it. The present plan, as written into the power contracts, is not a complete victory for either side, but it is sufficiently a public power project to carry the test forward. In the face of this fact it is quite unnecessary to impugn the motives of anyone concerned, in the absence of evidence. The experiment may well come to rank as an economic event of major importance in its bearing upon what is by way of becoming the most controversial public issue in the country. It would be very difficult indeed to find any good reason why such an experiment should not go forward, except an ancient prejudice against a political body's interposing itself between a private agent and an opportunity for profit. An illuminating fact is that private interests raise no objection to public provision of a water supply for Los Angeles. The subtle dividing line between public monopoly and private monopoly in the provision of essential services appears to be much more closely related to the prospect of profit than to care for the public interest.

It will be impossible to take up the more remote connotations of the Boulder Dam project here. There are unpleasant stories afloat of the political process by which the act made its way through Congress. Local benefits are in Congress commonly matters to be achieved by log-rolling. Political gossip has it that representatives of states interested in appropriations for the St. Lawrence Waterway and for the improvement of

navigation on the Mississippi River were won over by a reciprocal agreement.  If it should come to pass that the price of Boulder Dam were to include hundreds of millions spent upon those doubtful projects, even the most convinced supporters of the project might consider that the price was too great.  Boulder Dam is, however, more appropriately to be discussed on its merits and not as an example of the weaknesses of Congressional procedure.

One turns a little wearily from a prolonged study of the process by which this important public project has come into being.  It is not edifying.  It seems impossible that, out of so much bickering and misrepresentation and pursuit of special advantage, wisdom should emerge.  Yet there is another side.  Few projects have been accompanied by such searching investigations by qualified experts.  Seldom has a project had to stand up under such a mass of criticism, and justify itself in the face of so much prejudice, special interest, and inertia.  Legislators, unlike economists, are not privileged to indulge in mere study and analysis.  They must choose, for better or for worse.  No one can confidently predict what degree of success or failure will mark the Boulder Dam project.  On the evidence available it would, however, be difficult to deny that it represents a reasonable solution of the problems presented, or to assert that in any essential way it is opposed to "sound public policy."

The project justifies itself primarily as a turning to account of undeveloped sources of wealth.  Again, without enunciating a policy, it lends itself to what may well be regarded as a fruitful experiment in public enterprise in the power industry.  Finally, it illustrates in full complexity the operation of a new technique in government.  Regional problems, primarily economic in character, incapable of treatment exclusively through the con-

stituted agencies of the federal or state governments severally, and necessitating coöperative action or contractual relations between the various units of government, federal, state, and municipal, have a precedent here. It is to be supposed that this technique of government will prove desirable, even essential, in dealing with certain questions, particularly with respect to control of the power industry. No terms in the familiar vocabulary of American government or of American business fit the issues presented by Boulder Dam. It is an experiment in creative political action.

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# THE LEONTIEF AND SCHULTZ [1] METHODS OF DERIVING "DEMAND" CURVES [2]

### SUMMARY

I. The technique of the Schultz and Leontief methods, 219. — II. The logic of the methods, 223. — III. Application of both methods to price-quantity data for coffee, 232; copper, 237; sugar, 240. — IV. English import and export indexes, 242. — V. Comparison of the results of these experiments, 253. — VI. Criticism of the Leontief and Schultz logic, 255. — Conclusion, 260.

AMONG the methods proposed and used for the derivation of demand curves, two stand out preëminently. In Professor Henry Schultz' volume, The Statistical Laws of Demand and Supply,[3] he applies to price and quantity data for sugar a modification of the method developed by Professor Moore. Dr. Wassily Leontief of the University of Kiel sets forth a very different method.[4] Both Schultz and Leontief, however, claim that their respective methods are related to the logic of neo-classical theory, more particularly that of Marshall, and that the curves derived from statistical data by their procedures are, with certain reservations, comparable to the de-

1. The method which is here designated as that of Schultz is really an adaptation of the method originated by Professor Henry L. Moore. In the present paper, the regression lines, instead of the adapted line of fit used by Schultz, will be used, except in the case of Schultz' own sugar analysis. This is technically easier to compute and is based on the same logical analysis.

2. I must express my indebtedness to Professor W. L. Crum of Harvard University, and to Professor Joseph Schumpeter, of the University of Bonn, who read the manuscript with great care and discussed many points at length. I am also indebted to my husband, Professor Glennon Gilboy of the Massachusetts Institute of Technology, for keen criticism of the theoretical analysis.

3. See also The Meaning of Statistical Demand Curves, 1930. The University of Chicago Press, 1928.

4. "Ein Versuch zur Statistischen Analyse von Angebot und Nachfrage," Weltwirtschaftliches Archiv, July, 1929.

mand and supply curves of theory. Altho other statisticians have called their statistical curves classical, Leontief and Schultz are unique in their attempt to examine in detail the equilibrium theory in relation to their experimental curves.

The two methods have been applied in the present paper to price-quantity data for various commodities, namely, sugar, copper, and coffee, as well as to several price and quantity import and export index numbers for England.[5] The results of these two methods will be discussed in connection with the experiments in the following paper.[6]

## I

Altho Schultz derives laws of demand and supply for sugar, one commodity, he has the larger problem of the derivation of statistical demand and supply curves in mind. In his own words, "the object of this study has been to make an exploration into the difficult and interesting field of statistical economics, not to develop methods of forecasting the price or the production of sugar."[7] We may therefore take the method which he applies to the data on sugar alone as being of more general significance. The main steps in his method may be summarized as follows.

5. The data and the index numbers have been worked out by Dr. A. George Silverman, of the Massachusetts Institute of Technology, in connection with his thesis. He very kindly allowed the committee to use this material for experimental purposes. Some of the statistical data have been published in the Review of Economic Statistics for August, 1930.

6. These experiments have been carried on at the request of the Harvard Committee on Economic Research, in connection with a committee project, the statistical complement of economic theory. I am under great obligation to the committee for giving me the opportunity to make this study, and to Miss Katherine Hampson, of the committee staff, for the computations and the charts.

7. Op. cit., p. 190.

1. The demand and supply curves are derived separately: the one from data of prices and quantities *consumed*, the other from data of prices and quantities *produced*. In a closed economy (by which Schultz means a self-sufficing community) the quantities produced and consumed would be equal, and the same data would be used for the derivation of demand and supply curves.[8] As the existence of a closed economy is very rare, however, it may be assumed that in most cases Schultz would use different data for deriving demand and supply curves.

2. The data may be adjusted for the effect of changes such as price level and population, by dividing the price series by a general index of prices, and by taking the amount consumed per capita. As far as sugar was concerned, Schultz found that practically the same results occurred from the use of adjusted as of unadjusted data. Whether or not the data are to be adjusted, depends upon the nature of the series concerned.

3. The variations due to the influence of secular trend are eliminated from both the price and quantity series (adjusted or unadjusted) either by fitting a trend line to each time series according to the method of least squares, and by using trend ratios instead of the original data, or by employing link relatives.

4. The trend ratios (or link relatives) of the price and quantity series are then correlated.

5. The line of best fit to the trend ratios of price and quantity, plotted on a scatter diagram, is then taken. This line of best fit may be one of the regression lines.

8. See Schultz, op. cit., pp. 101–103, 132–136, 162–168, for a discussion of demand and supply curves in a closed economy, and his analysis of the world production and consumption of sugar as an illustration. His assumption that the amount produced and consumed would be the same in a closed economy may, however, be questioned. Part of the amount produced at any one time might be withheld from the market.

Schultz, however, uses a line fitted according to normal criteria, i. e. it is the line from which the sum of the squares of the perpendicular distances of the points from the line is the least. The fit of such a line is based on the assumption that the deviations of the points from the line are caused by errors in both variables, and not, as in the case of the regression lines, that the deviations are due to errors in one variable alone.[9]

6. The equation of this latter line is the equation of the demand curve, from which is derived the coefficient of elasticity by finding $\frac{dx}{dy}$ and multiplying by $\frac{y}{x}$, where $y =$ the price, and $x =$ the quantity.

7. This demand curve is in terms of trend ratios or of link relatives, and applies to the whole period under consideration. Curves for each year within the period may be determined from the general equation, by substituting the ordinates of trend, or the figure for the previous year, depending upon whether trend ratios or link relatives have been used. Schultz calls these the absolute demand curves for each year (following Moore) and says that their relative positions are a measure of the shifting of demand over time.

The method developed by Leontief is based on a general theoretical exposition which goes back to Marshall. Mathematically it is considerably more complicated than Schultz' procedure. I cannot hope to set forth the mathematics of the method here [1] and shall merely summarize the steps in the computation of the results.

1. Leontief derives the demand and supply curves

9. Allowance can be made for unequal weighting of the variables (see Schultz, The Meaning of Statistical Demand Curves, p. 54).

1. Those interested will find the mathematics developed fully by Dr. Robert Schmidt in the appendix to Dr. Leontief's article.

together as coördinated lines from average price and quantity figures. Sometimes the quantity data are consumption and sometimes production figures. He does not deal with the question of the difference between production and consumption data and its effect on the nature of the derived curve.[2]

2.  The price-quantity data are plotted on a double logarithmic scale and are used as logarithms throughout the entire process. Each price-quantity point is numbered according to its sequence in time.

3.  For the computation the data are divided into two equal sections.

4.  The cotangents of the angles made by the demand and supply curves with a line drawn parallel to the base are computed from the following formulae: [3]

$$\eta_1 = \frac{\lambda_1 x_1 - a x_2}{\lambda_1 z_1 - a z_2}$$

$$\eta_2 = \frac{\lambda_2 x_1 - a x_2}{\lambda_2 z_1 - a z_2}$$

These cotangents, $n_1$ and $n_2$, are equivalent, according to Leontief, to the Marshallian coefficients of elasticity of demand and supply expressed in logarithmic terms

$$\left( \text{i. e.} \ \frac{dx}{dy} \ \cdot \ \frac{y}{x} = \frac{d \log x}{d \log y} \right)$$

---

2.  See Schultz on this, op. cit., Appendix II.

3.  The derivation of the formulae and the meaning of the symbols employed may easily be found in Leontief's article, pp. 28–36. Briefly, however, $x_1$ and $x_2$ are the sums of the squares of the $x$'s (quantities) of the two periods, measured from the mean of the system, and $y_1$ and $y_2$ are the sums of the squares of the $y$'s (prices). Similarly, $z_1$ and $z_2$ are the sums of the products of the $x$'s and $y$'s.

$$a = x_1 y_1 - z_1^2$$
$$b = x_1 y_2 + x_2 y_1 - 2 z_1 z_2$$
$$c = x_2 y_2 - z_2^2$$

$\lambda_1$ and $\lambda_2$ are the roots of the quadratic equation $\lambda^2 - b\lambda + ac = 0$.

5. The demand and supply curves are drawn through the price-quantity distribution on the scatter diagram and through the mean of the system by use of these cotangents. A protractor is used for the actual drawing of the lines.[4]

6. The shifting of demand and supply over time is measured by taking the differences of each price-quantity point, in the order of its sequence in time, from the average supply and demand curves. These deviations from the demand and supply curves respectively, measured in the direction of the other line, are then plotted on a time chart, and show the course of shifting of the demand and supply curves over time.

## II

Both Schultz and Leontief come out with average demand and supply curves, and average coefficients of elasticity, but they arrive at these results through very different processes of reasoning. They both come forth with measures of shifting, and both of them appear to confuse in different ways static and dynamic concepts in connection with their derived demand and supply curves. Each of these points needs to be taken up in some detail and this section of the paper will include an analysis of the theory, either implicit or explicit, involved in the two methods.

Schultz has an excellent section on the theory of demand, in which he compares the laws of demand of the classical and mathematical schools, and discusses their statistical application.[5] In so far as the mathematical

4. Schultz, however (Appendix II), derives the lines by computing their equations from the cotangents.
5. Op. cit., chap. 1, "Considerations Relating to Demand." See also chap. 4, "Theoretical Considerations Relating to Supply," for a discussion of the peculiar problems connected with the supply curve. In this paper, the theory of demand, rather than that of supply, is to be dealt with. See also The Meaning of Statistical Demand Curves, chap. 3.

school makes the demand for one commodity a function
not only of its own price, but of the prices of all commo-
dities, Schultz considers it preferable to the classical law,
in which the prices of all other commodities are assumed
constant. But this law of demand is a static law, and
can be made dynamic only by including time as an in-
dependent variable as well. What is more, "In an in-
ductive investigation . . . the statical laws of demand
may only be approached, but never realized." [6]

Altho Schultz considers that the method of multiple
correlation, by which the relationship between a number
of variables can be taken into account and both dynamic
and static curves derived, is most satisfactory from a
theoretical angle, he points out that it is frequently very
difficult to achieve from statistical data. He cites
Moore's derivation of the law of demand for cotton as
an example of the way in which both dynamic and static
laws can be derived from the same data by multiple cor-
relation.[7] It is worth giving the main equations here in
order to make clear two points. The demand curve is
assumed to have the following equation:

$$(1) \quad X_0 = \phi \,(X_1, X_2, X_3, \ldots, X_n)$$

$X_2, X_3, \ldots X_n$ represent the changes in the prices of
other commodities; $X_1$ the changes in the quantity of
commodity $A$, and $X_0$ the changes in the price of quan-
tity $A$. The type of the function may then be assumed.
The simplest assumption is, of course, that the function
is linear, in which case the equation becomes

$$(2) \quad X_0 = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + \ldots a_nX_n$$

Schultz quotes Moore to the effect that the latter equa-
tion is a "dynamic law of demand in its complex form."
A static law may be derived from the same equation,

6. Op. cit., p. 28.          7. Ibid., pp. 29–31.

according to Moore, by assuming that one of the variables on the right-hand side of the equation is most important in determining $X_0$, and putting all the others equal to zero.

The first thing to be said about this analysis is that time is not included explicitly in the functional equation. It is supposedly taken care of by the fact that the $X_0$, $X_1$, ... $X_n$ are not expressed in their original values, but in terms of percentage changes, link relatives, or trend ratios, and that the data may have been adjusted as well for changes in population and in the general price level. As I have stated before,[8] this process eliminates time, and the dynamic changes due to time, in so far as secular influences are concerned. Equation (2) therefore expresses, not a complex dynamic [9] law, but a complex static law. Holding all but one of the independent variables constant merely simplifies the situation, but does not change the nature of the curve. Even if equation (2) *were* dynamic, I cannot see that holding all but one independent variable constant would make it static, in so far as time is to be considered.[1] Whether or not these variables can legitimately be held constant in actuality is another moot question.

Schultz, however, does not use the method of multiple correlation, largely because he found that the dynamic factors affecting the demand for sugar are secular in nature, and could be taken care of by the method of link relatives or trend ratios alone. He therefore deflated his

8. See article in Quarterly Journal of Economics, August, 1930.

9. If dynamic changes are defined as changes due primarily to time variation.

1. Unless, of course, time were included as an explicit function, which is not the case in either Moore's or Schultz' analysis. Moore and Schultz appear to use dynamic in several different ways, usually as referring to time elements, but here as meaning the variation of elements at the same time. Cf. E. J. Working, Quarterly Journal of Economics, February, 1927.

price series, adjusted his quantity series for population changes and eliminated secular trend from both. The resulting law of demand he characterizes as follows:

The law of demand derived in this study is a *dynamic* law; it describes in summary form the "routine of change" of an important economic phenomenon. It is the dynamic law of demand in a simple form (link relatives or trend ratios). It is quite different from the static law of demand of the classical writers. "The statical law may be only approached but never realized in inductive investigation."[2]

Without going into detailed criticism at this point, I should like to suggest that Schultz is wrong in calling his law of demand a dynamic law. In so far as time is eliminated, and dynamic factors due to time taken care of, it may, under certain conditions, approximate the static law of neo-classical theory. It seems to me that Schultz' law of demand is an example of the type of reasoning whereby the derivation of an approximately static law is assumed to result from the elimination of time, within a certain period of time, taken as the classical "instant."[3] Such a demand curve would be an average curve, applying to the period of time as a whole and not to specific instants within the period. Such a demand curve would apply *only* to the period of time under consideration and could not be used for forecasting. Schultz himself recognizes this and warns against using the equation to his demand curve for extrapolation.[4]

Schultz appears to regard the price-quantity points on the scatter diagram as points on a demand curve. This is logically true, from the point of view of the equilibrium analysis, only if one of two hypotheses can be made concerning supply. Ordinarily the points on the

2. Op. cit., p. 94.
3. See my article in Quarterly Journal of Economics, August, 1930. That seems to me the implied logic behind his method. See also The Meaning of Statistical Demand Curves, p. 40.
4. Op. cit., p. 93.

scatter diagram are points of intersection of instantaneous demand and supply schedules and lie on both curves. They can be said to lie on the demand curve alone, (1) if supply can be disregarded as a determining factor, or (2) if it is known that the demand curve has remained stable during the period under consideration and that the supply curve alone has moved. In the latter case the moving supply curve obviously traces the course of the static demand curve.[5] It is somewhat difficult to see the reason for trend elimination if such is true. It might be argued that demand would never remain absolutely stable, and that the elimination of trend would tend to remove any shifting. It would, but it would also remove the shifting of supply due to the trend element. Taking out the trend, in this instance, merely serves to remove one time factor which may cause the supply curve to shift, and thus to determine the demand curve. It may be, of course, that it is desirable to isolate cyclical or random movements. If such is the case, the elimination of trend serves a purpose.

If the first supposition is made, however, that supply can be disregarded as an independently determining factor, the elimination of trend becomes more reasonable. Suppose the supply of a commodity during a certain period of time were in the hands of a monopolist. In this case, the price-quantity data for that period might be looked upon as points lying about the demand curve. They might be regarded as experiments of the monopolist upon an existing demand curve, in order to determine maximum net profit. The important thing is, however, that the supply is drawn forth solely in response to the

5. This type of reasoning is well known to economists in this field. It has been especially well put, and illustrated by diagrams, in the article by Leontief which is under discussion in this paper. See also E. J. Working, op. cit.

demand.[6] The clearest case can be made for the derivation of a static demand curve under these assumptions if the demand curve is known to have remained stable during the period. It may, however, have shifted. If this is true, time elements can be removed to approximate the static norm for the period, and the residue of variation can be assumed to represent movement about a static demand curve. Technically the trend can be removed by a general trend elimination, such as that of Professors Moore and Schultz, or by taking out separately population growth, income growth, and price level changes, in the manner of Dr. Roth.

The basis of Leontief's logic [7] is to be found in his concept of the equilibrium analysis. Altho he himself considers that his approach is Marshallian, he has quite evidently been influenced by the more explicitly logical members of the mathematical school. Leontief thinks of supply and demand curves as descriptive, from different points of view, of the relation between a fixed quantity in the market and the prices at which it will be bought or sold, at a moment of time. The demand curve represents the scale of consumers' choices, determined, in turn, by their psychological scale of values. The supply curve describes the scale of production costs; that is, the scale of costs under which the fixed quantity now on the market was in the past produced. His analysis of the psychology of consumers' choices and the differing costs of production which he considers under "Struc-

6. This supposition has been made by Dr. Hans Roth, in deriving the demand curve for coffee in Germany. See Die Übererzeugung in der Welthandelsware Kaffee in Zeitraum von 1790–1929, Jena, 1929. This was brought to my attention and discussed by Professor Schumpeter. The method is his, and was applied by Dr. Roth.

7. I shall go into more detail concerning Leontief's argument, as his work is available only in German, whereas Schultz' is in English. Leontief sets forth his theory in op. cit., Part A, Die theoretischen Grundlagen des Verfahrens, pp. 3–24.

turwandelung" appears to be merely an attempt to explain the causes which make the structure of the instantaneous schedules what they are at any moment of time. Leontief does not state this in as rigid a form as I have set it down, but it is clearly implied in his assumption that the demand and supply curves cannot be derived separately, but must be derived together from the same data.[8] This is precisely what he does in his own method; he derives coördinated curves from the same price-quantity data.

These instantaneous demand and supply schedules are assumed always to take the form of straight lines on a double logarithmic scale. When changes in demand and supply occur, they are assumed to be the sort of changes which do not affect the structure of the schedules, but merely their position in the economic system over time. The shape of the schedules does not change, or, in other words, their elasticity is constant over time.

In a statistical price-quantity distribution referring to a period of time, Leontief assumes that each point is the point of intersection of an instantaneous demand and supply schedule of the kind described in the preceding paragraph. The position of the equilibrium points during a period of time is determined by changes in the position of the instantaneous schedules. The scatter of the points, is, in short, determined by the shifting of the schedules, and by shifting alone. The shape of the curves, to repeat, does not change, altho Leontief realizes that structural, or elasticity, changes are bound to

8. See op. cit., p. 20, footnote, in which he discusses Moore's derivation of elasticity. This he criticizes because Moore computes *separate* coefficients of elasticity of demand and supply and therefore gets separate curves. "Bei einem solchen Ansatz ist es aber nicht möglich, die Elastizitäten im Sinne der Marshallschen Theorie statistisch zu ermitteln. Denn jede Berechnung der Nachfragekurve muss dabei mit irgendeiner willkürlichen Annahme über den Verlauf der Angebotskurve verbunden werden, und umgekehrt."

occur over time.  He assumes, however, that the results of elasticity changes appear as changes in the level of the curves, or in shifting, rather than in changes in their structure.  Shifting is therefore the only type of dynamic change which is considered in his procedure.[9]

Two rigid assumptions are made concerning the way in which shifting takes place in the economic system. The shifting of the schedules is supposed to be parallel on a double logarithmic scale.  And the respective shiftings of supply and of demand are assumed to be independent of each other, i. e. a positive shifting of the demand schedule has an equal chance of being associated with a positive or a negative shifting of the supply schedule.

On the basis of those assumptions, a picture is set up describing the relations between the price-quantity points plotted on a double logarithmic scatter diagram. Each point is seen as the intersection point of two instantaneous hypothetical schedules, which move independently of each other, and in a certain way, to new positions in the economic system, and thus determine new points of equilibrium.

Further, each point is assumed to be the mean of the group of points on the static demand and supply schedules.  If the shifting of the curves, which is supposed to be parallel, is still further assumed to take place *along* the other curve, then two coördinated lines can be fitted to these points, by an adaptation of the method of least squares.[1]  These lines will pass through the mean of

9. Leontief has a long exposition of the difference between "Structurwandelung" and "Niveauverschiebungen," the nature of each sort of change, and the reasons why elasticity changes may be disregarded (pp. 7–17).  The validity of these reasons will be discussed later.

1. See appendix for the mathematical proof.  In connection with the mathematical procedure, the data are divided into two equal periods and it can be proved mathematically that only one set of curves is the same in each part.  See Schultz' criticism in The Meaning of Statistical Demand Curves, Appendix II.

the system, and the cotangents of the angles they make with a line parallel to the base line, drawn through the mean of the system, will be the average coefficients of demand and supply for the interval under consideration. The formulae for the derivation of $n_1$ and $n_2$ are based on this reasoning.[2]

Once the average demand and supply curves are fitted to the price-quantity distribution, they establish a static norm for that interval of time. They represent the underlying structure of the separate and instantaneous curves for each instant of time and describe the average position of the equilibrium during the period. Altho time is not eliminated by any statistical method, it is eliminated by the logical conception of a constant structure or elasticity. Time, acting in a rigidly defined fashion, however, causes the scatter of the points around the normal curves, and the differences of the points from the fitted line are the measure of the only time variation Leontief admits by hypothesis, namely, shifting. These differences are in essence the deviations of one static state from another, that is, of each instant in the time interval from the norm for the entire period. Consequently, Leontief's method can hardly be considered dynamic, even tho it does allow for the entrance of the time factor in a certain way.

## III

Both of these methods have been used in experimenting on price-quantity data for coffee, copper, sugar, and quantity and price indexes for English foreign trade.[3]

2. See supra, p. 225.
3. The experiments with Dr. Silverman's index numbers were partly induced by the suggestion made by Dr. Staehle (see Die Analyse von Nachfragekurven, p. 41, published by the Frankfurter Gesellschaft für Konjunkturforschung), recommending the use of index numbers of re-

### COFFEE

The Schultz method was used to derive a demand curve from data upon the estimated consumption of coffee in the United States (imports corrected for re-exports) and the average import price, from 1881 to 1913.[4] When a straight line trend was fitted to both the
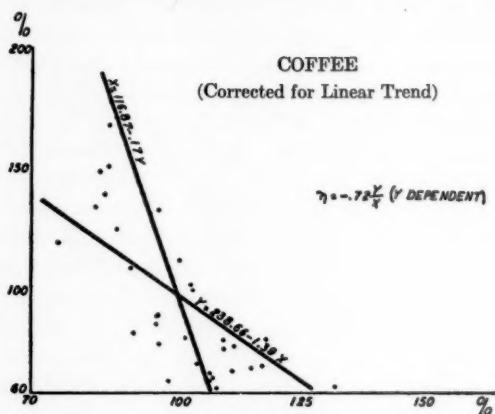


FIGURE 1

quantity and price series and the trend ratios correlated, the coefficient of correlation was −.48. A third degree parabola fitted to both series produced a correlation coefficient of −.507. Figure I shows the regression lines fitted to the scatter of the linear trend ratios; Figure II those fitted to the scatter of the curvilinear trend ratios. In the first case the line in which $X$ is dependent is a better fit; in the second, that in which $Y$ is

lated commodities in the place of price-quantity data for single commodities. Dr. Staehle considered that this was one way of taking account of the variation in the prices and quantities of other commodities.

4. Data were taken from the Bureau of Foreign and Domestic Commerce figures in the United States Statistical Abstract.

dependent. The coefficient of elasticity for the first is
−.17; for the second, −.75, a considerable difference in



COFFEE
(Corrected for Curvilinear Trend)
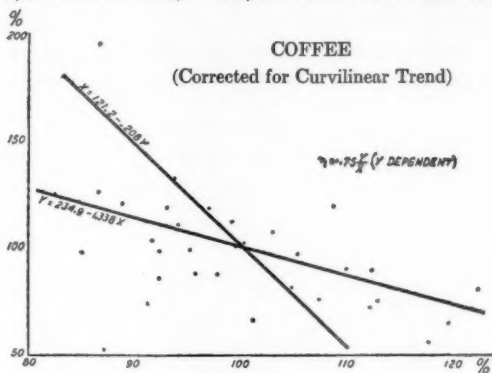
FIGURE 2

SHIFTINGS OF COFFEE
(Corrected for Linear Trend)
(*Schultz Method*)
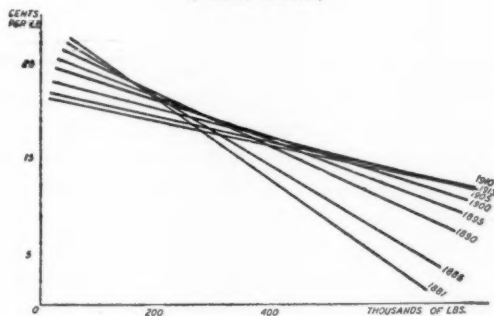


FIGURE 3

elasticity, altho both are less than unity and therefore
on the inelastic side.

Figure II shows a situation of greater statistical value
than Figure I. The scatter about the regression lines is

less and the curve a better fit. The correlation coefficient is higher, as well. Evidently the curvilinear trend is better for these data.

The shiftings of coffee for both the above curves are seen in Figures III and IV. It is interesting to note that

SHIFTINGS OF COFFEE
(Corrected for Curvilinear Trend)
(*Schultz Method*)
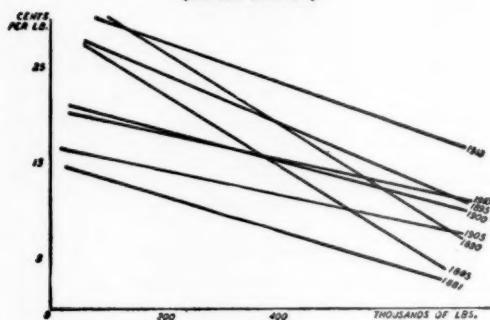


FIGURE 4

the shiftings for both curves change their shape and position in time. The shifting for the data corrected for linear trend follows a regular rotary movement.

Figure V shows the demand and supply curves resulting from the application of the Leontief method. The logarithms of the figures have been plotted on an arithmetic scale. The negatively sloped line is the supply curve; the positively sloped line, the demand curve. It is of interest to note that $n_1$ or cot $\beta$, which in Leontief's illustrations is the negative coefficient, is the positive coefficient in the case of coffee. Similarly $n_2$ or cot $a$, which should be positive according to Leontief, is here negative. There appears to be nothing in the mathematics, according to Professor Crum, to determine that

$n_1$ or $n_2$ should always be negative or positive, or that
one or the other must always be the demand or supply
curve; and it may be asked whether the negatively
sloped line is always the demand curve and the posi-

**COFFEE**

*(Leontief Method)*
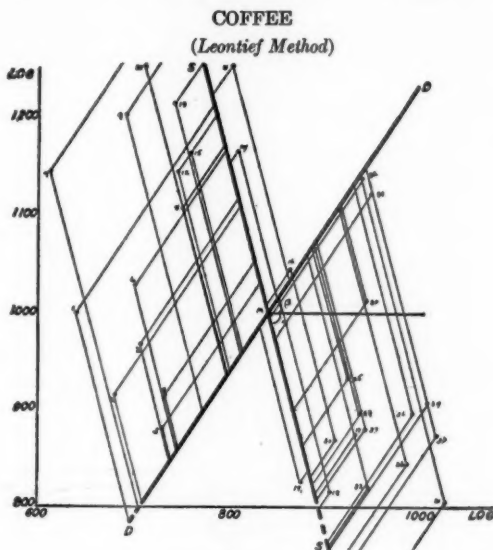


FIGURE 5

tively sloped line the supply curve. Leontief does not
deal with this problem. The average coefficients of
elasticity (i. e. cot $\beta$ and cot $\alpha$) are $-.2778$ and $+.6565$.[5]

5. The fact that these cotangents are expressed in logarithmic terms
makes practically no difference in comparing them with other elasticity
coefficients. It is not necessary to transfer them to natural numbers, as
they are indicative of the entire logarithmic set-up which Leontief as-
sumes. (See p. 35.) Leontief suggests that an estimated price or quan-
tity change be computed by multiplying the elasticity coefficient by the
log of the quantity or price and its increase, and then reducing the result
to natural numbers. The difference in result obtained from this process,
however, and that obtained by simply using the coefficient as it stands is
negligible.

The curves of shifting of supply and demand (the deviations of each price-quantity point from the supply and demand curves, measured in the direction of the other curve) are plotted as time series in Figure VI.
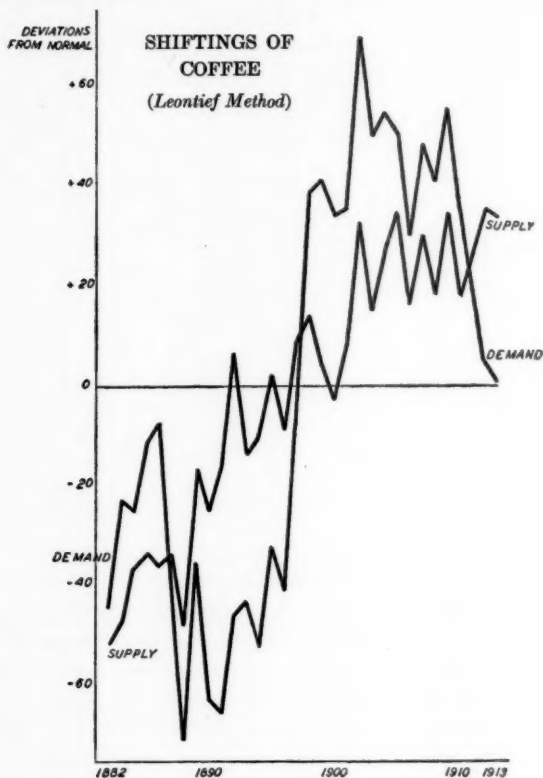


FIGURE 6

## COPPER

Figure VII indicates the curve derived for copper by the regression method. The regression line in which $Y$ is dependent was taken as the best fit to the scatter of price-quantity points. The correlation coefficient was $+.451$, not a very significant figure. The price-quantity

COPPER — LINK RELATIVES
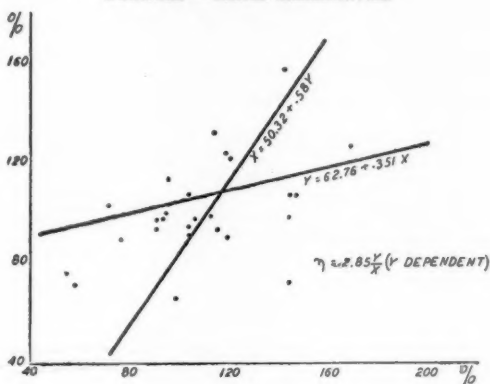


FIGURE 7

points on the scatter diagram are link relatives of the annual average price of New York electrolytic copper (in cents per ounce troy) and of the apparent domestic consumption of refined new copper (domestic production of copper, corrected for imports, exports, and producers' stocks). The elasticity coefficient is $+2.85$ It is to be noted that the curve is positively inclined, altho the method is the same as that which is used to derive negatively sloped curves. A similar result was obtained in the application of this method to pig iron by Professor Moore, and the reason for the positive in-

clination of that curve has caused considerable specula-
tion.[6]

It has been a subject for controversy as to whether
this positive curve was a demand or a supply curve.
Staehle thinks that it is really a demand curve and that
the positive slope is due to the faulty elimination of
time. There is more to be said logically, however, for
the path of equilibrium hypothesis.[7] As long as time is
not eliminated, the derived curve is neither a demand
nor a supply curve, but a path of equilibrium over time.
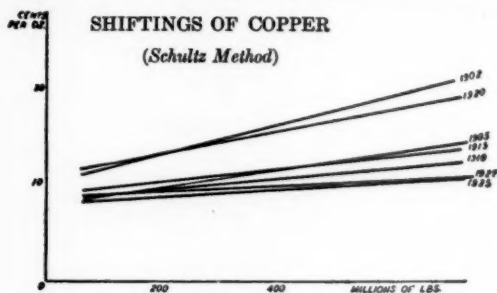


FIGURE 8

It may have either a positive or a negative slope, de-
pending upon the changes in elasticity or shifting of the
unknown instantaneous schedules, acting upon their
equilibrium points. Thus the fitted curve, as in the case
of copper or pig iron, can have a positive slope and be
explained in a logically consistent way. If it can be
established that the supply curve has not moved, and
that the demand curve has, then the resulting curve is
the supply curve for that period of time.

The shiftings, obtained by substituting the items for
the preceding year in the general link relative equation,

6. See Moore, Working, and Staehle in works previously cited.
7. See Quarterly Journal of Economics, May, 1930.
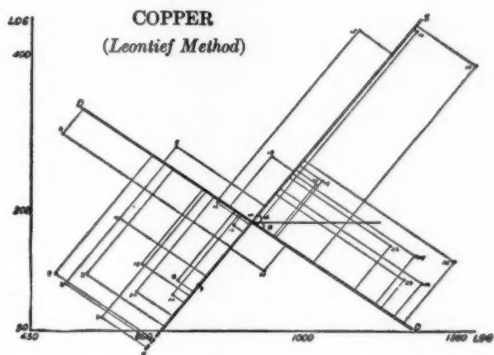
FIGURE 9
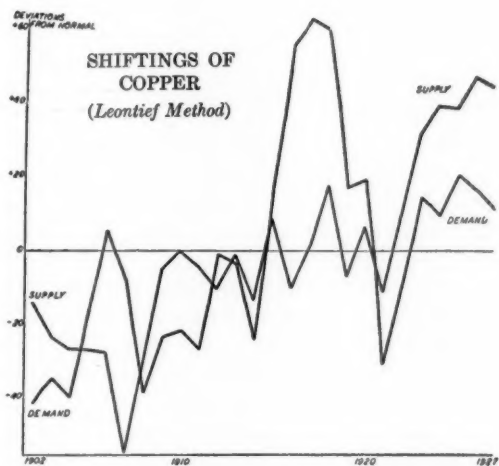


FIGURE 10

may be seen in Figure VIII. The lines change slope slightly, and are not successive in time.

In Figure IX is exhibited the demand and supply curves derived by the Leontief procedure. The average coefficient of elasticity of demand is $-1.5495$; of supply $+.8215$. The shiftings, grouped as time series, are shown in Figure X. Their cyclical form is evident.

## Sugar

Schultz himself has derived a curve for sugar.[8] This curve is not an ordinary regression line, as has been the case for the curves fitted to the price-quantity data for



SHIFTINGS OF SUGAR
(*Schultz Method*)
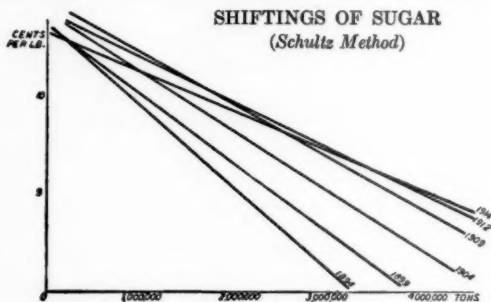
FIGURE 11

coffee and copper. It has already been explained [9] that the curve was fitted so that the sum of the squares of the perpendicular distances from the points to the line was at a minimum, so that variation in both variables is considered. This curve was fitted both to trend ratios and link relatives of the data, with the corresponding coefficients of elasticity, $-.51$ and $-.5433$.

Schultz does not show the shiftings of his curves graphically, altho he computes one or two of his "abso-

8. See op. cit.        9. See supra, p. 220.

lute equations" as examples. Figure XI indicates the shifting of the demand curve computed from trend ratios, for certain selected years within the period. The

**SUGAR**
*(Leontief Method Applied to Schultz Data)*



FIGURE 12



**SHIFTINGS OF SUGAR**
*(Leontief Method)*
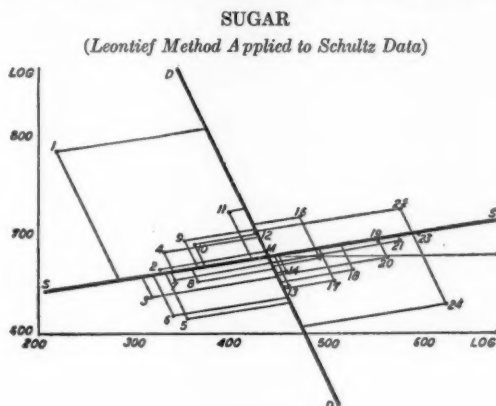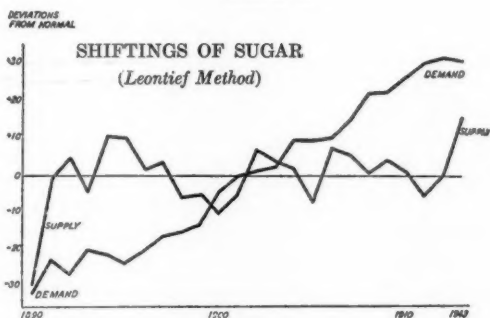
FIGURE 13

curves are successive in time, but their slopes change considerably.

In Figure XII may be seen the demand and supply curves according to Leontief. The average coefficient

of elasticity of demand is $-.34$; of supply $+7.55$.[1] The shiftings are plotted on Figure XIII. The cyclical movement of the supply shiftings and the steady increase in demand are particularly noticeable.

## IV

### ENGLISH IMPORT AND EXPORT INDEXES, 1880–1914

It has frequently been suggested that demand curves could be derived for groups of related commodities with more theoretical basis, than for one commodity alone. Thus the variation of closely related commodities could be measured, without artificially abstracting one of them. For this reason, the two methods were applied to certain index numbers of commodity groups. The data used for the application of these two methods to index numbers were English trade figures supplied by Dr. A. G. Silverman of the Massachusetts Institute of Technology. They comprise index numbers of the total quantity of goods imported into and exported from England during the period, and import and export price indexes. They also include separate indexes of both prices and quantities for cotton, and iron and steel exports. The methods were applied to the data as has been explained in the previous cases. It was expected that the relation between the prices and quantities of goods imported would show the demand of England for the commodities of other countries, and that the export relationship would indicate other countries' demand for England's goods. It is dubious, however, as to whether the actual results show anything of the kind.

1. With 1914 data omitted and two twelve-year periods taken as the two parts.

A correlation coefficient of $+.087$ resulted from the link relatives of total import quantities and prices. The scatter diagram, with the regression lines, may be seen in Figure XIV. The regression line in which $X$ is de-

**IMPORTS**
**(Link Relatives)**



FIGURE 14
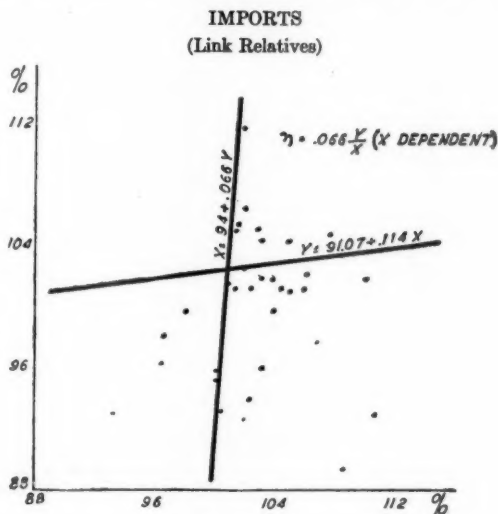
pendent appears to be the better fit, altho neither of them are significant, because of the low numerical correlation coefficient. It may be noted that both curves are positively inclined. The coefficient of elasticity of demand for the regression line selected is $+.066$. The shiftings by the Schultz procedure which are parallel but not successive in time are shown in Figure XV. The Leontief method results in a coefficient of elasticity of demand of $-1.2126$; of supply of $+.7318$. The schedules, with the logarithmic scatter, are shown in Figure XVI and the shifting curves in Figure XVII.

Total export quantities and prices were correlated with the resulting coefficient of $+.313$ and with the scatter diagram and regression lines of Figure XVIII.

SHIFTINGS OF IMPORTS
(*Schultz Method*)



FIGURE 15

TOTAL IMPORTS
(*Leontief Method*)
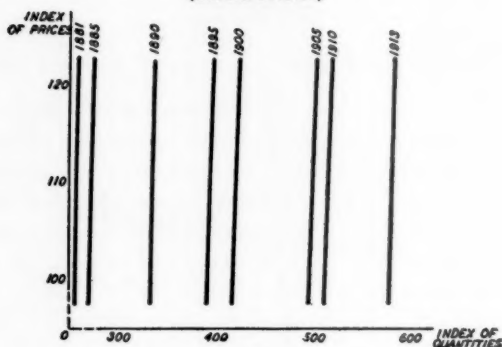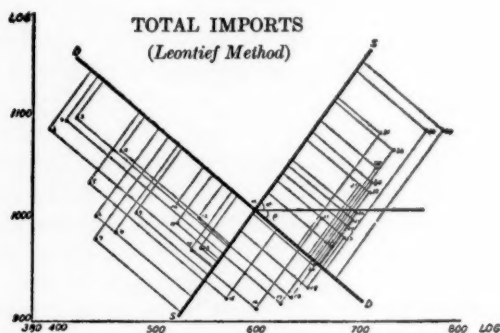


FIGURE 16

The line in which $Y$ is dependent is the better fit, which makes the coefficient of elasticity $+1.94$. The shiftings, according to Schultz, are exhibited in Figure XIX.

SHIFTINGS OF IMPORTS
(*Leontief Method*)

FIGURE 17

TOTAL EXPORTS
(*Link Relatives*)
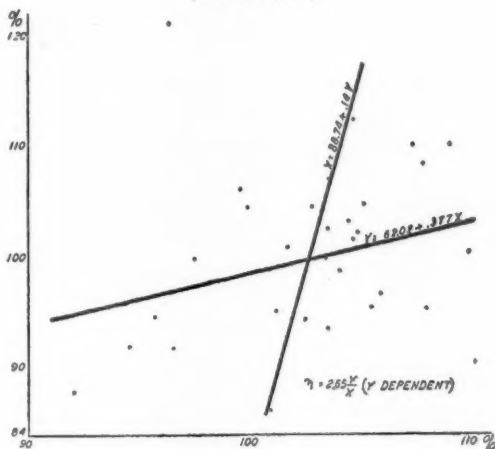


FIGURE 18

Again, changes both in the slope and position of the
lines are evident. The Leontief coefficients are $-6.0773$
for demand; $+1.5727$ for supply. Figures XX and XXI
show the schedules and their shiftings, respectively.

SHIFTINGS OF EXPORTS
*(Schultz Method)*
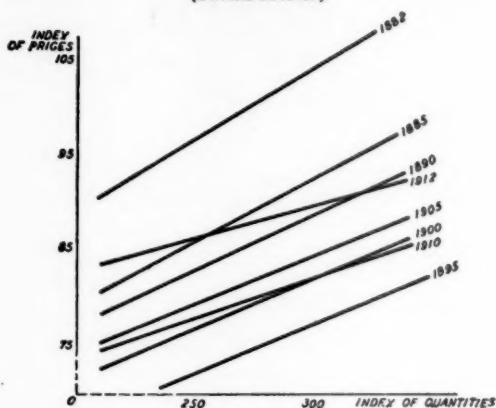


FIGURE 19

The iron and steel price and quantity indexes show a
positive correlation coefficient of $+.569$. As is indicated
on Figure XXII, the regression line in which $Y$ is de-
pendent is the best fit to the data, making the coefficient
of elasticity $+2.31$. The shiftings by the Schultz method
are given in Figure XXIII. Both the schedules derived
by the Leontief procedure are positively inclined
(Figure XXIV) with coefficients $+1.2177$ of demand
and $+2.5801$ of supply, respectively. Figure XXV gives
the course of shifting, according to Leontief. This is
probably a case similar to that of copper, where the
shifting appears to have been on the demand side. In
such a situation the Leontief curves have no meaning.

## TOTAL EXPORTS
### (Leontief Method)



FIGURE 20

## SHIFTINGS OF EXPORTS
### (Leontief Method)
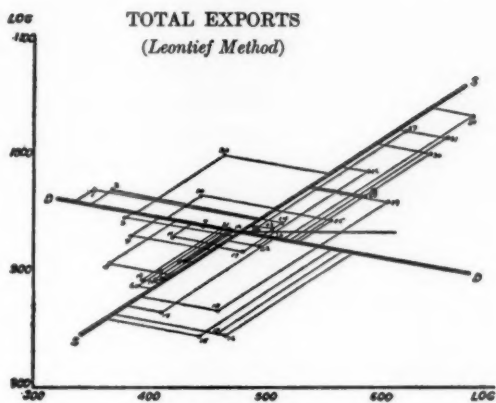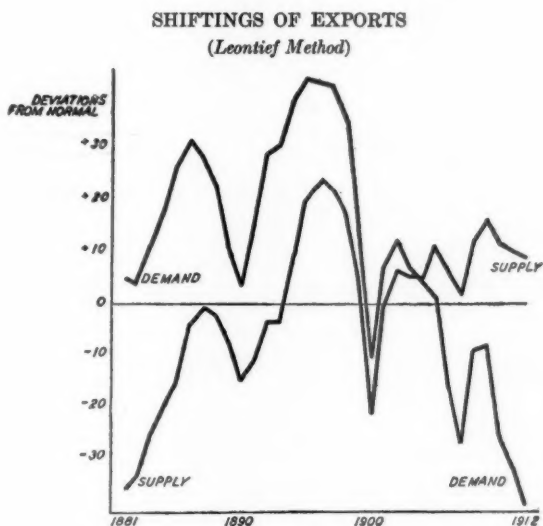


FIGURE 21

They both come out here as positively inclined, probably because his fundamental assumption of movement by both curves is not fulfilled in fact.

Cotton exports are the only ones of the index number series to show a negative correlation (the coefficient is −0.21), but this is of almost no significance. Figure XXVI exhibits the scatter diagram and regression lines.

### IRON AND STEEL EXPORTS
#### (*Link Relatives*)
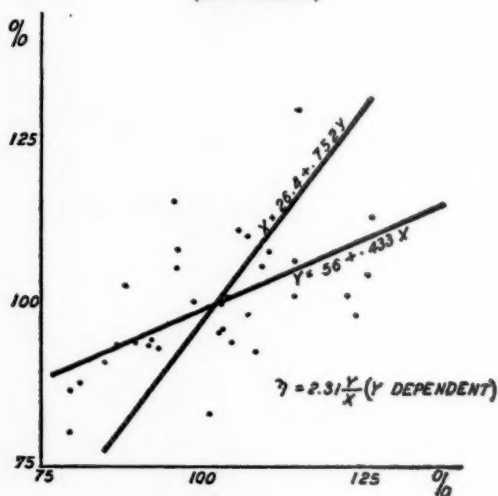


FIGURE 22

Taking the one in which $Y$ is dependent as best fitting, the coefficient of elasticity is −.016. Figure XXVII shows the Schultz shiftings, which are parallel but not successive during the period. By the Leontief method the coefficient of elasticity of demand is −.5169; of supply +.5930. The curves and scatter are shown in Figure XXVIII and the shiftings in Figure XXIX.

## SHIFTINGS OF IRON AND STEEL
### (*Schultz Method*)
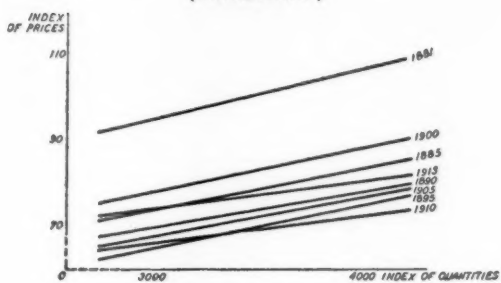


FIGURE 23

## IRON AND STEEL
### (*Leontief Method*)
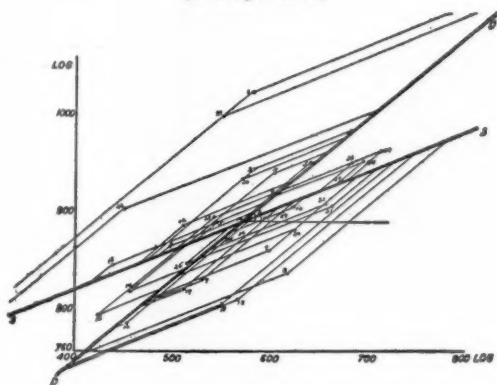


FIGURE 24

SHIFTINGS OF IRON AND STEEL
(*Leontief Method*)
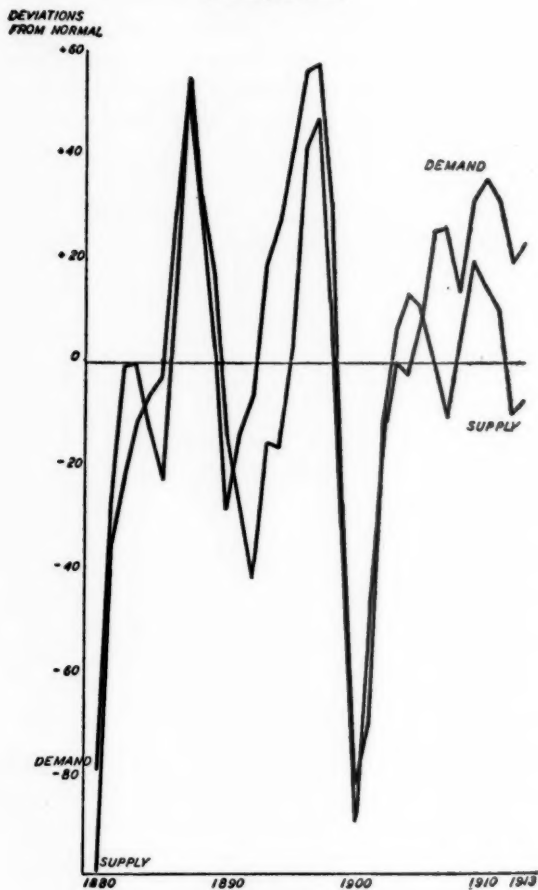


FIGURE 25

## COTTON EXPORTS
### (Link Relatives)
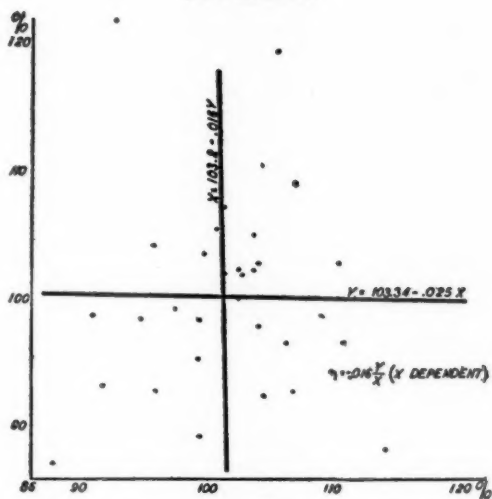


FIGURE 26

## SHIFTINGS OF COTTON EXPORTS
### (Schultz Method)
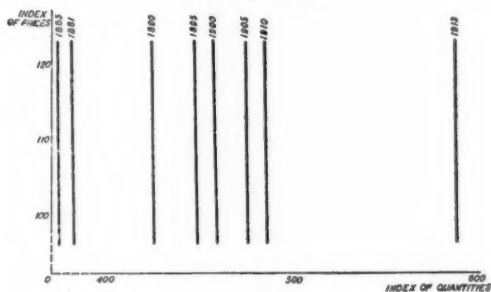


FIGURE 27

COTTON EXPORTS

(*Leontief Method*)
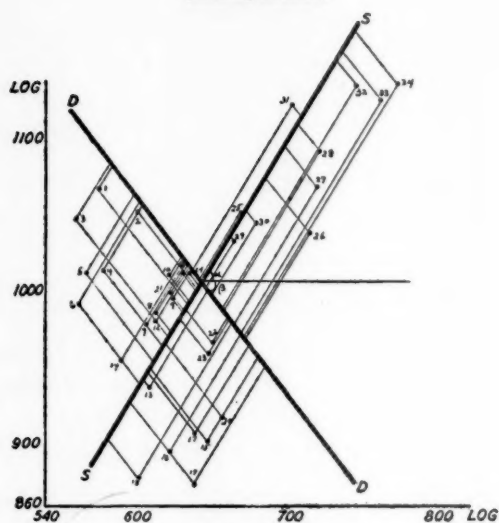


FIGURE 28

SHIFTINGS OF COTTON EXPORTS

(*Leontief Method*)
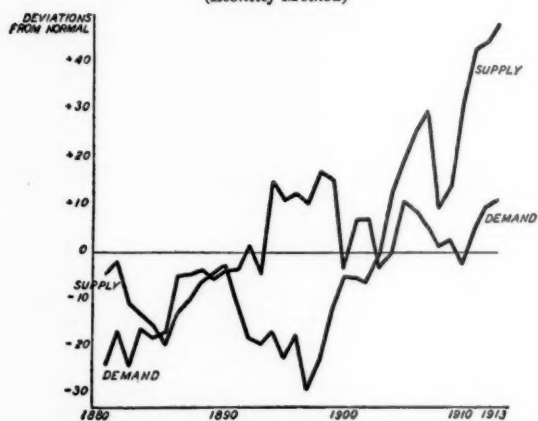


FIGURE 29

## V

It may well be asked what these coefficients and measures of shifting mean. Both Schultz and Leontief purport to measure the average elasticity of demand over a given interval of time, and the shiftings of instantaneous schedules for given years within the period from the average schedules for the entire period. There ought, therefore, to be some relation between the results of two methods, supposedly measuring similar phenomena. A summary comparison of the elasticity coefficients is given in the following table:

| | | COEFFICIENT OF ELASTICITY OF DEMAND | |
| | | Schultz* | Leontief |
|---|---|---|---|
| Coffee | Corrected for curvilinear trend ...... | − .75 (− .208) | + .6565 |
| | Corrected for linear trend ........... | − .72 (− .17 ) | |
| Copper.................... | | +2.85 (+ .58 ) | −1.5495 |
| Sugar...................... | | − .51 | − .34 |
| Total imports.............. | | + .066 (+8.77 ) | −1.2126 |
| Total exports.............. | | +2.65 (+ .14 ) | −6.0773 |
| Iron and steel exports ....... | | +2.31 (+ .752) | +1.2177 |
| Cotton exports............. | | − .016 (−40.0) | − .5169 |

* The coefficient of elasticity of the regression line, not selected as the line of best fit, is in parentheses. In the case of the low correlation coefficients, there was little to choose between the two lines, as may be seen from the scatter diagrams.

The table indicates, for the most part, a distinct difference in the elasticity coefficients derived by the two methods. The Schultz coefficients have practically no significance in the case of total imports and cotton exports, due to their negligible correlation coefficients. Schultz himself has pointed out the necessity for a significant correlation coefficient in his method. These examples have been included, however, to show what absurd results may be found by the indiscriminate application of a technical method. Leontief, however, pays no attention to the question of systematic relation

between the variables. Only in the case of sugar and possibly of iron and steel are the coefficients similar in both sign and amount. The sign alone is the same in the case of cotton; the amount alone in the cases of copper and coffee. Schultz has derived the Leontief coefficients for his sugar data [2] and found that altho the demand coefficients were about the same, the supply ones were totally unrelated. He therefore concluded that both of these coefficients were "devoid of economic meaning." I should say rather that they are devoid of meaning in so far as the assumptions on which the method is based are not fulfilled in fact. However, the point to be made here is that the two measures of average elasticity are absolutely incomparable. Both of them cannot, therefore, be measuring the average elasticity of demand for a period of time. One of them must be wrong; perhaps both of them are.

A similar difference in results appears in comparing the measures of shifting. There is practically no correspondence between the positive and negative shifts as indicated on the charts. It may easily be observed by comparing the charts that the high and low years according to the two measures of shifting have no relationship on the whole. Sometimes they are inverse. Evidently the two measures of shifting are as little comparable as the elasticity coefficients. It is of some interest that the curves of shifting of the Leontief method are in every case cyclical in form. The meaning of the Schultz measure of shifting is not at all clear to me. Technically, of course, it is easy to substitute the actual item for the year in the general equation in terms of trend ratios or link relations. But what is this "absolute" curve for each year that results? What is its rela-

2. His results differ from the above, due to his use of different periods when dividing the figures into two parts. See The Meaning of Statistical Demand Curves, Appendix II.

tion to the general curve for the period? What determines the difference in slope of these "absolute" curves?

Many of the results of these two methods appear ridiculous in fact. Both methods may easily be applied from a technical standpoint to any price-quantity data. But what is their meaning in any particular case? The difficulty of answering this question is shown by the above figures and charts.

## VI

There are apparent certain inconsistencies in the logic of the authors themselves which may be briefly considered. Again the Leontief procedure will be dealt with in greater detail, owing to its comparative inaccessibility.

Schultz and Leontief both confuse static and dynamic concepts in the interpretation of their respective procedures. Schultz calls his derived curves "dynamic" supply and demand curves, altho he has eliminated in so far as is possible the changes occurring over time, that is (in the case of sugar), population and price movements, and secular trend. His resulting curve is therefore not dynamic, but static, at least in approximation. In one place Professor Schultz appears to recognize this. In discussing the method of trend ratios, particularly as related to Edgeworth's conclusion as to the impossibility of deriving demand curves, in the theoretical sense, from statistical data, he says:

By taking the ratios of our variables to their respective trends we are practically overcoming the chief difficulties which, according to Edgeworth and others, lie in the way of deriving statistical laws of demand. For our data, tho extending over a period of years, may, when thus adjusted, be conceived of as representing approximately observations taken at a given point in time — at least for practical purposes.[3]

3. Op. cit., p. 33.

The next paragraph carries the idea still further, when Professor Schultz observes that "an *ideal* method would eliminate entirely all of the disturbing factors." [4] In other words, Professor Schultz seems to have in mind the type of reasoning I have outlined,[5] in which the "instant of time" of the classical and neo-classical economists is extended to apply to an actual period of time, throughout which all dynamic effects due to the entrance of time factors have been removed. The logic behind Professor Schultz' analysis, however, is not clear to me. Even if all disturbing factors could be eliminated, the result would not be a demand curve, unless it is known that supply can be disregarded.

If both supply and demand are determining factors and both schedules have moved during the period in question, then the separate schedules, in the Marshallian sense, cannot be derived from statistical price quantity data, and even an average picture of equilibrium cannot be attained, without assumptions such as those made by Leontief. The elimination of time factors merely reduces the scatter to a cluster of points about a single point. If this time removal could be statistically perfect, a single point would result. As a matter of fact, experiments have shown that this is the case. The clearest example is that of gasoline, where the successive elimination of seasonal and secular influences caused the points on the scatter diagram to approximate closely a central point.[6]

Leontief draws no explicit distinction between dynamic and static concepts, but he asserts that he is applying Marshallian principles to data which extend over

4. Ibid.
5. See Quarterly Journal of Economics, August, 1930.
6. I hope to go more fully into this and related questions at some other time.

time. He is applying an admittedly static method to a situation in which time and other dynamic changes are involved. Theoretically this is made possible by a number of assumptions, most of which are very questionable, from the point of view of the statistical data available. In the first case, Leontief assumes a logarithmic relation between price and quantity over time. This is an assumption which cannot be made generally, without empirical test; in some cases it is true; in others it is not.[7] However, making this initial assumption, Leontief regards each price-quantity point as the intersection of two instantaneous demand and supply curves, which are assumed to be straight lines on a logarithmic scale. Each point is, in reality, an equilibrium point. Barring the assumption of a logarithmic relation, Leontief's reasoning is so far similar to that of Mr. E. J. Working and myself. Instead of fitting one curve to the data, however, and calling that a path of equilibrium, he fits two, which represent the normal or average demand and supply curves for the period. These curves are derived from the series after it has been divided into two parts, with the further assumption of constant elasticity within the two parts.

Mathematically, it can be shown (see Appendix) that there are two curves and only two which are the same for each part. These are the demand and supply curves. As Schultz points out, there is no reason for the arbitrary division of the data into two parts and a great difference in results appears by varying the division.[8] These curves then represent the underlying static situa-

7. However, it is a more likely assumption than that of a straight line on an arithmetic scale. Cf. Pigou in the Economic Journal, September, 1930, p. 392.

8. See op. cit., p. 107. Schultz' technical criticism of the Leontief method appeared after I had used the method myself and formulated my own criticisms as given above.

tion for the period. Their shape and inclination are the same as the shape and inclination of the individual instantaneous schedules, since Leontief also assumes that the elasticity of these curves does not change from year to year, or month to month. Shifting is, therefore, the only change over time allowed by hypothesis, and this shifting takes place in a rigidly defined manner. The instantaneous schedules are supposed to move parallel to each other, and, also, independently of each other. The deviations of the points from the normal fitted curves express the extent of the shifting of the schedules from year to year.

One has, then, from Leontief's procedure, a method of setting up an average equilibrium of demand and supply within a given interval of time, and a measure of the shifting of demand and supply within that interval. This result, however, occurs only when his hypotheses are fulfilled in actuality, and this is seldom the case. The logic of Leontief's analysis is correct, granting his assumptions; but it applies to a situation which practically never exists. The assumptions of constant elasticity, of parallel and particularly of independent shifting are very dubious. There is certainly no reason to assume in general that the elasticity of the demand and supply schedules remains the same over a period of time. In fact, changes in the shape and inclination of the schedule, particularly sudden changes in the scale of wants, in the relation between various wants at the same periods of time are occurring continually. Leontief meets this criticism, which he anticipates, by admitting that elasticity changes are, in fact, likely to occur and by assuming that their effect is always to be observed in shifting. Again, this is a questionable assumption.

As to the independence of the shifting of demand and supply, it is clear that this cannot be generally assumed.

As a matter of fact the two are often very closely related. The history of consumption would show many cases in which a large increase in supply, sufficient to indicate a shifting of the schedule, would eventually cause a similar shift in the demand schedule. As people find more of a commodity available, they become accustomed to use more of that commodity, first perhaps at a lower price, and later at the same price. The growing use of sugar in the eighteenth century exemplifies this. The increase in consumption is partly to be explained by elasticity changes, that is, a greater quantity available at a lower price, but there was also a shift in the entire schedule. In the same way, a shift in demand will often call forth a shift in supply. It is true that the relation between the two changes may not be apparent immediately. It takes place over time, and there is usually a lag in the response of the schedule which is, for the time being, the dependent variable. One would therefore observe a varying rate of dependence between the two. I do not mean to indicate that it is impossible for the shifting of the demand and supply schedules to be independent. But it appears to be very unlikely.

Leontief's mistake, in this assumption as in his others, lies in trying to set up a general theory for the application of the equilibrium analysis to statistical data, without sufficiently inquiring as to whether his general assumptions are in accord with fact. As a possible statistical theory it is logically correct, but as a generalized procedure for deriving demand curves related to Marshallian analysis, it is useless, on the whole. It would be a very rare set of price-quantity data over a period of years or months which would fulfill the assumptions which Leontief lays down. One may therefore agree with Schultz that in actual fact Leontief's elasticity coefficients are "numerical accidents," and

meaningless.  Logically, none the less, the method is far superior to that of Schultz.

In conclusion, we have here two methods purporting to measure the average elasticity of demand and the shifting of demand over time.  They differ in assumptions, in logic, and finally in results.  They are in no way comparable.  It is obvious that they cannot both be measuring demand in the same sense, if they measure it at all.

Neither the technical simplicity of the Schultz, nor the logical nicety of the Leontief method should lead the investigator to place uncritical faith in their results. The Schultz curve is a demand curve only in case supply can be disregarded as an independent factor, or supply alone moves; the Leontief curve does not measure demand unless his hypotheses are found to be true to fact for the commodity in question.  This can be found out only by examining the history of the commodity and by obtaining all available information, frequently other than quantitative.  It is probable that their practical value in verifying theoretical analysis will prove to be small.  The difficulty of securing sufficiently exact information about commodities makes it hard to tell when the assumptions are fulfilled.  In any case, commodities which do meet the conditions of the hypotheses are probably rare.

The solution of the problem of the statistical derivation of static Marshallian demand curves must for the present, I think, be given a negative answer.  Except in the cases where supply alone moves, or can be disregarded, instantaneous schedules cannot be derived.  If both supply and demand change, then the price-quantity points fall about a path of equilibrium, and the shape of the instantaneous schedules is unknown.  Their

shape and manner of change may be assumed, as Leontief does, but it would seem almost impossible to make assumptions of a sufficiently inclusive nature to serve as the basis of a general method.

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# SOME EFFECTS OF THE ENGLISH UN-EMPLOYMENT INSURANCE ACTS ON THE NUMBER OF UNEMPLOYED RELIEVED UNDER THE POOR LAW

## SUMMARY

Introductory survey of legislation, 262. — I. Developments 1920–1926, 265. — The Act of 1927, 273. — II. Leniency of Boards of Guardians not an adequate explanation of conditions, 275. — III. Extent of overlapping of Poor Law and Insurance System, 280. — Analysis of recipients of aid from both, 285. — Conclusion, 287.

ONE of the chief arguments in favor of unemployment insurance is that the unemployed would not have to look to relief agencies for support during periods of depression. Under the relief system the demand for funds comes at just the time at which the community can least afford to meet it; under unemployment insurance the burden of supporting the unemployed is more evenly distributed in both time and space. Such is the theory. How does it work out in practice? While an exact answer cannot be given to the question, something may be learned from studying England's experience.

In 1911, when the first unemployment insurance act was passed, England had a policy, nearly a hundred years old, of giving poor law relief to able-bodied persons only in workhouses. While the Boards of Guardians of the Poor were allowed to disregard this policy during short periods of severe emergency, on the whole it was adhered to, and the number of able-bodied men in receipt of outdoor relief because of unemployment was very small.[1] But the question of aiding the unemployed

1. Figures are available for January 1 of each year since 1891. Between that date and 1911 the number of such persons fluctuated from 297 in 1900 to 7,872 in 1905, showing a correlation of $+.74 \pm .09$ with the percentage of trade unionists unemployed. This group constituted about 3 per cent of all the men given outdoor relief.

was not solved by this policy, and various devices, from public relief works to trade union out-of-work benefits, had been tried with little success.

The Act of 1911 was frankly experimental, being limited to a group of trades in which the expectation of unemployment was highest. It seemed to be successful. Huge reserves were piled up (the total reached £6,700,-000 by 1916), and 1,600,000 workers in trades that had expanded greatly during the War were added to the insured. Then in 1920, with rapidly falling percentages of unemployment and a balance of £21,000,000 in the Unemployment Insurance Fund, the Unemployment Insurance Act of 1920 was passed. This provided for the insurance of practically all the manual workers in the country, with the exception of agricultural laborers and domestic servants, and of all others receiving a salary of less than £250 a year.

The 1920 Act went into effect on November 8. Within six weeks the industrial situation was so bad that an amending act was passed to lighten the conditions for the receipt of benefit. Unemployment grew worse, poverty became intense, and during the next seven years Parliament experimented in thirteen acts with various ways of relieving the distress through unemployment insurance. The culmination came in the Act of 1927, under which all insured persons are granted benefit as of right as long as they are out of work. During the ten years since 1920 the number of insured unemployed has rarely dropped below a million, and it is again close to the two million mark. Heavy loans from the government have been necessary to enable the Unemployment Insurance Fund to pay its benefits during the worst periods, and it is still far from solvent. Such being the situation, the question this paper attempts to answer is: To what extent has this far-reaching insurance scheme

been able to support the unemployed and thus prevent a rush to the Poor Law [2] for aid?

The answer is at first glance discouraging. While before the War there were at most a few thousand persons given outdoor relief because of unemployment, the figures now run into hundreds of thousands. (See Table II.) Is this because the unemployment insurance system is not as all-embracing as it appears to be on the surface? Is it that Poor Law policy has grown more lenient since Guardians of the Poor are elected and Labour controls more seats? Or is it that insurance benefits must be supplemented by Poor Law grants when families are large and the unemployment period long? Probably all of these factors are operative, but it is the purpose of this paper to attempt to disentangle some of them by considering the following factors: (1) To what extent changes in the number of unemployed persons relieved under the Poor Law have corresponded to changes in the unemployment insurance acts, the amount of unemployment being held constant. (The answer to this question might suggest to what extent the demand on the Poor Law was due to the unemployment system not being all-embracing.) (2) To what extent the number of unemployed persons relieved under the Poor Law has varied from place to place, and to what extent such local variation has corresponded to local variations in the amount of unemployment. (The answer to the question might give some light on the question of how much of poor relief was due to leniency among the Boards of Guardians.) (3) What proportion

2. Poor relief in England is administered almost wholly under the Poor Law. Altho some money is, of course, distributed by private agencies, this is not, as is the case in the United States, the chief source of relief. Therefore the discussion in this paper will be confined to public poor relief.

of the insured unemployed have received both unemployment insurance benefits and poor relief, and under what circumstances such double aid was given.

I

On January 1, 1920, about nine hundred men were in receipt of Poor Law relief [3] because of unemployment; within a year they and their dependants had increased to thousands. For in November, 1920, the depression which has continued up to the present time began. Unemployment, which had been hovering around three and four per cent, jumped to eight and then, by May, 1921, to 23 per cent. Here was a test *par excellence* for the unemployment insurance system. Could it prevent a rush to the Poor Law for aid? Table I shows in approximate figures [4] what happened during the first year, and Table II carries the series up to date.

The figures in Tables I and II are plotted on Chart I. To the dotted line marking the percentage of insured persons registered as unemployed should be added the number out of work because of trade disputes. These latter account for the peak periods in poor relief — a coal strike in April, 1921; an engineering and shipbuilding dispute in June, 1922; and the great coal stoppage and general strike of 1926. The 1922 dispute

3. All poor relief figures in this paper were secured from Persons in Receipt of Poor Law Relief in England and Wales, a one-day count issued annually by the Ministry of Health as a Parliamentary paper, and from the Ministry's quarterly reports on the same subject, these being somewhat less detailed and published as non-Parliamentary papers.

4. Exact figures of the unemployed insured given poor relief were not published until March, 1922. Table I shows the total number of persons given outdoor poor relief. An approximation to the number relieved because of unemployment was secured by assuming that the number relieved for other causes stayed constantly at about 500,000. This assumption seemed justified, since the Ministry of Health noted in each quarterly report that the increases were due to changes in the number of unemployed relieved.

called out 300,000 men, while that of 1926 involved a million.

The chart makes it clear that, aside from strike periods, the curve of persons granted poor relief because of unemployment followed in its general outline the curve

### TABLE I

APPROXIMATE NUMBER OF PERSONS RELIEVED BECAUSE OF UNEMPLOYMENT (SEPTEMBER, 1920, TO MARCH, 1922) COMPARED WITH THE PERCENTAGE OF INSURED UNEMPLOYED

| Date | Total in receipt of poor relief (in thous's) | Approximate number relieved for unemployment | | Actual number so relieved (in thous's) | Percentage of insured work-people un-employed |
|------|------|------|------|------|------|
| | | Number (in thous's) | Per 10,000 total pop. | | |
| March, 1920 | 494.3 | .... | .. | | 4.0 |
| June | 492.6 | .... | .. | | 3.0 |
| September | 499.9 | .... | .. | not stated | 3.0 |
| December | 567.9 | 67.0 | 1.8 | | 7.9 |
| March, 1921 | 653.5 | 153.0 | 4.0 | | 15.4 |
| June | 1,299.1 | 799.0 | 21.0 | | 22.4 |
| September | 1,243.0 | 743.0 | 19.8 | | 14.2 |
| December | 1,366.5 | 866.0 | 22.8 | | 18.0 |
| March, 1922 | 1,465.0 | 965.0 | 25.3 | 859.0 | 16.1 |
| June | 1,769.3 | 1,169.0 | 30.6 | 1,153.0 | 13.7 |

of unemployment. But the correlation is far from perfect. One factor making for changes in the number relieved under the Poor Law may well have been changes in the unemployment insurance acts, which were amended so frequently during this time. Hence the periods during which the various unemployment insurance acts were in force are also marked (by vertical lines) on the chart. By an analysis of this chart an attempt will be made to answer our first question: Was the rush to

## TABLE II

NUMBER OF PERSONS IN RECEIPT OF OUTDOOR POOR RELIEF BECAUSE
OF UNEMPLOYMENT (WEEKLY AVERAGES FOR MONTH STATED) AS
COMPARED WITH THE PERCENTAGE OF INSURED WORKPEOPLE
UNEMPLOYED

| Date | Persons relieved because of unemployment, including dependants (in thousands) | Per 10,000 population | Percentage of insured unemployed |
|---|---|---|---|
| March, 1922 | 859 | 225 | 16.1 |
| June | 1,153 | 302 | 13.7 |
| September | 809 | 212 | 12.7 |
| December | 752 | 197 | 12.8 |
| March, 1923 | 703 | 184 | 11.7 |
| June | 626 | 164 | 11.3 |
| September | 598 | 156 | 11.7 |
| December | 572 | 149 | 10.6 |
| March, 1924 | 556 | 145 | 9.8 |
| June | 464 | 121 | 9.4 |
| September | 366 | 95 | 10.6 |
| December | 372 | 97 | 10.7 |
| March, 1925 | 386 | 100 | 11.1 |
| June | 391 | 101 | 11.9 |
| August | 462 | 119 | 12.1 |
| November | 530 | 136 | 11.0 |
| March, 1926 | 541 | 140 | 9.8 |
| June | 1,639 | 421 | 14.6 |
| August | 1,757 | 452 | 14.0 |
| November | 1,490 | 383 | 13.5 |
| February, 1927 | 580 | 149 | 10.6 |
| June | 489 | 125 | 8.9 |
| August | 477 | 122 | 9.4 |
| November | 481 | 123 | 9.9 |
| February, 1928 | 495 | 126 | 10.4 |
| May | 434 | 110 | 9.8 |
| August | 385 | 98 | 11.6 |
| November | 387 | 98 | 12.2 |
| February, 1929 | 433 | 110 | 12.2 |
| May | 358 | 91 | 9.9 |
| August | 347 | 88 | 10.1 |
| November | 347 | 88 | 11.0 |
| February, 1930 | 369 | 93 | 13.0 |

CHART I[1]

EFFECT OF THE UNEMPLOYMENT INSURANCE ACTS ON POOR RELIEF FOR UNEMPLOYMENT

Adult persons and their dependants receiving outdoor poor relief for unemployment (per 10,000 pop.) — Average weekly number for month stated ————— ; ————— A, excludes those on strike.

Insured persons unemployed (per 1,000 insured) on one day near the end of the month - - - - - - X Severe strikes.
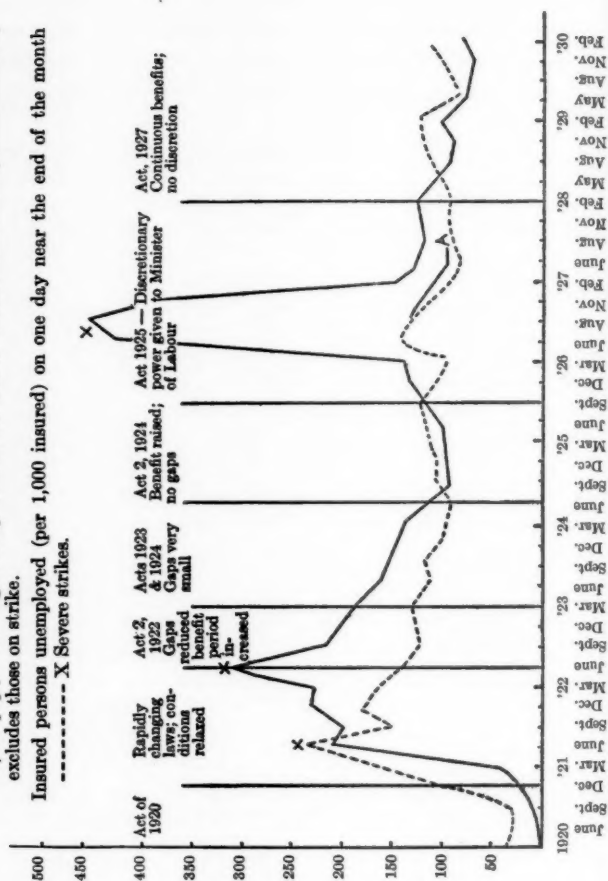
the Poor Law for aid occasioned by the fact that the unemployment insurance system did not adequately cover the contingency against which it insured? Did a lightening of conditions for the receipt of insurance benefit result in a decrease in the demand on the Poor Law?

The first period shown on Chart I pictures the situation before and at the beginning of the depression period. Unemployment stood at three to four per cent, and outdoor relief for unemployment was negligible. The Act of 1920, in effect in November, followed closely the provisions of the 1911 Act: twelve contributions had to be paid before a worker was elegible for benefit; one week's benefit was granted for each six weeks' contributions; a maximum of fifteen weeks' benefit a year was allowed; and the benefit rate for adult men was fifteen shillings a week. Then the depression came, before the insurance law had been in force long enough for most of the insured to be eligible for benefits. So the unemployed flocked to the Poor Law, and Parliament set to work adjusting the insurance system to meet the emergency. A new act, lightening the conditions for the receipt of benefit, was passed and put into effect immediately, and after it came others of even milder conditions; but the upward sweep of poor relief figures was not checked until well into 1922.

This was the situation during the second period marked on the chart. Under the first amending act (December, 1920) eight weeks' benefits were to be paid during the next three months to the unemployed who could show ten weeks' insurable employment during the preceding year and four weeks' employment since July, 1920. Before that period of three months had passed, another act had created two "special periods" of eight months each during which a maximum of sixteen weeks' benefit was payable.

With the new year unemployment mounted rapidly — 11 per cent in January, 15 per cent in March, 23 per cent in May — and poor relief for unemployment jumped from about 67,000 to nearly 800,000. By December, 1921, altho the second of the two special benefit periods was in operation and special grants were being given to the dependants of persons out of work, poor relief figures were even higher; and in the early part of 1922 the engineering and shipbuilding dispute sent the numbers to over a million.

The attempts at fitting the insurance law to the new conditions were continued. (Section three on Chart I.) The periods of special benefits (the benefits that were paid beyond the fifteen-weeks-in-a-year period set by the 1920 law) were extended to November, 1923; the "gap periods," during which no "special benefits" were payable, were cut shorter and shorter; and the maximum period of benefit was so increased that by the Act of 1923 it covered forty-four weeks in the year.[5]

It was under these laws that the principle of "uncovenanted benefits" was developed — the "dole" of such ill repute. By the Act of 1921 the limitations on benefit were changed to six contributions for each week's benefit, with a maximum of twenty-six weeks' benefit in any insurance year. The benefits each worker had a right to expect on the basis of his contributions

5. It has been calculated that the following were the effective number of weeks' benefit allowed under the various acts:

| Date of Act | Weeks of benefit | Length of gap period |
|---|---|---|
| Act of 1920 | 15 | . |
| March, 1921 | 24 | . |
| July, 1921 | 33 | . |
| April, 1922 | 29.8 | 5 weeks |
| July, 1922 | 35.75 | 1 week |
| March, 1923 | 46 | 2 weeks |
| November, 1924 | 52 | . |

Felix Morley, Unemployment Relief in Great Britain, p. 68.

were called "covenanted benefits," while "uncovenanted benefits" were those given in addition to this twenty-six-weeks-in-a-year allowance. They were not charity, as has often been claimed, for they were paid out of the funds collected in the ordinary manner, supplemented by heavy loans from the government; but they were, nevertheless, benefits beyond the original plan of the insurance acts.

Another important extension of the insurance system, framed also as a temporary device to meet the unprecedented distress, was the granting of dependants' allowances, five shillings a week being allowed for a dependent wife or husband, and one shilling for each dependent child. These extensions of the unemployment insurance scheme came into operation in the end of 1921, but the coal strike of the next year probably obscures the effect they had on poor relief figures. However that may be, the poor relief figures did start downward once the strike was over, and continued downward well into 1924. The amount of unemployment also decreased during this period, but the drop in poor relief was out of proportion to this change and seems to have been due to the changes in the insurance law.

The lightening of conditions for the receipt of benefit reached its upper point in the Act of 1924, when the amount of benefit was increased to eighteen shillings a week for single men, and uncovenanted benefits (under this act, called "extended benefits") were lengthened to cover the whole year. The period during which this act was in effect (section five on the chart) saw poor relief numbers at their lowest in the whole ten years, excepting only during 1929, when an act of much the same tenor was in operation.

In 1925 the insurance law was again amended, this time to give the Ministry of Health discretionary power

in the distribution of extended benefits. Under its rulings the following classes were practically excluded from such benefits: (1) single persons residing with relatives; (2) married women (or married men) who could look for support from their husbands (or wives); (3) those working short time but earning sufficient for maintenance; (4) aliens.

The effect on poor relief was immediate, as the sixth section of Chart I shows. Altho unemployment fell, poor relief figures rose nearly 50 per cent above the earlier low point. Then came the coal stoppage and great strike of 1926, during which time the effects of the unemployment insurance acts were obscured. The situation is indicated, however, in the Quarterly Statement of Poor Relief for November, 1926, where separate figures are given showing the number of insured receiving poor relief for ordinary unemployment and those receiving it while on strike. These suggest that the increase for 1926, shown in Chart I, was due almost entirely to the coal dispute, and that otherwise poor relief figures would have stayed at about the February, 1926, level, as was the case during 1927.

The Act of 1926 repeated the conditions of the 1925 Act and set January 1, 1928, as the date for its expiration. In the meantime, the Unemployment Insurance Committee under the leadership of Lord Blanesburgh reviewed the whole insurance system and submitted its recommendations to Parliament. Its preliminary statement reflects the attitude of the country toward unemployment insurance: "It has been recognized by all who have appeared before us, and we ourselves share the view, that an *unemployment insurance scheme* must now be regarded as a *permanent feature* of our code of legislation" [6] (italics mine). Thus, altho there was violent

6. Report of the Unemployment Insurance Committee, 1927, p. 28.

debate in Parliament on the proposed provisions of the
new bill, which was being suggested as a permanent
measure as contrasted with the temporary provisions of
the previous eight years, and altho some of the most im-
portant recommendations of the Blanesburgh Com-
mittee were disregarded in framing the new act, there
was no suggestion that the system should be discarded
or even that the features originally supposed to be tem-
porary — the dependants' benefits and the extended
benefits — should be done away with. In spite of its
high cost and in spite of the optimism with which its pro-
ponents predicted the country's speedy return to normal
economic conditions, it was tacitly recognized that the
wide unemployment insurance scheme had been useful
(some went as far as to say that it had prevented revo-
lution) and would still be necessary.

The most striking feature of the Act of 1927, which
went into effect on April 19, 1928, is that it gave up the
concept of extended benefits, and granted to all insured
workers who complied with the statutory conditions
benefits as of right so long as they should be out of work.
Two other changes of potential importance to the Poor
Law were incorporated into the insurance law. The
scale of benefits was changed, and the thirty-contribu-
tions rule was reinstated. The allowance to single men
was cut a shilling a week, so that they now receive seven-
teen shillings, and the allowance to younger men was cut
even more. Benefits on account of adult dependants
were raised from five to seven shillings a week.

The thirty-contributions rule — that thirty contribu-
tions to the Insurance Fund must have been made dur-
ing the two years preceding an application for benefit —
was new only in the sense that it was proposed that it
should be enforced. It was recognized, however, that
the rule could not be put into effect immediately without

throwing many persons out of benefit,[7] and a temporary arrangement was made instead which is still in effect. Under it a person is elegible for benefit if he has made eight contributions during the two years preceding his application or if he has made thirty contributions at any time.

The Act of 1927 is like the Act of 1924 in that there are no gap periods during which insurance benefits lapse, and the payment of benefits is not subject to Ministerial discretion. During the period that it has been in force the amount of unemployment has been much the same as that of the 1924 period, and the number of persons given poor relief because of unemployment has also been quite similar. Nor does the number applying for Poor Law relief seem to be rising greatly, altho unemployment percentages are again going up.[8]

It would seem, then, that the fluctuations of the past decade in the number of unemployed persons granted poor relief have been due largely to the changing char-

7. It was known, for instance, that 10 per cent of the men drawing benefits during the three and a half years preceding April, 1927, had been out of work at least 60 per cent of that time. Investigation into the Personal Circumstances of Claimants to Unemployment Insurance, Ministry of Labour, 1927, p. 47.

8. Part of the difference may be due, however, to causes outside the unemployment insurance system. From the middle of 1926, the Ministry of Health was engaged in a campaign to decrease out-relief. Drastic, sudden changes were not demanded, but all along the line there was a definite tightening-up. A new system of investigation of case records by the Ministry's corp of inspectors was initiated, and increased control by the Central Authority was given in the Audit (Local Authorities) Act of 1927 and the Guardians' Default Acts of 1926–27. In this way it was hinted to Boards of Guardians that they should cut down on the number of their cases. To those for whom such hints were too gentle there was the example of the deposed Boards of Guardians of West Ham, Chester-le-Street, and Bedwelty, and the fear of disqualification from local office due to too high surcharges. Thus policy cannot be assumed to have remained constant during 1927 and 1928, and some of the decrease in the number of unemployed may have been due to these administrative changes. Whether the Labour Government has modified this system is not known, but Chart I shows that poor relief figures have not changed materially since it came into office.

acter of the unemployment insurance acts. When there were gap periods and benefits were not paid, the Poor Law figures increased. When there were strikes and men were not elegible for benefit, the pressure on the Poor Law was enormous. When the Ministry of Health could say who should and who should not receive benefits, more people looked to the Poor Law for support. But now that there are no gap periods and no strikes, and Ministerial discretion has been abolished, there are still thousands of unemployed insured men (57,000 in February, 1930) who are in receipt of Poor Law aid. What accounts for this group? Leniency on the part of the Boards of Guardians or inadequacy in the insurance benefit scales? The next two sections will attempt to answer these questions.

## II

It has frequently been asserted that much of the reason for the large number of unemployed persons supported by the Poor Law lies in the leniency of certain Boards of Guardians.[9] Tables III and V, however, suggest that this is far from an adequate explanation of the situation.

An exact comparison between the amount of unemployment and the number relieved because of lack of work cannot be made, for Unemployment Exchange Areas and Poor Law Unions are not coextensive with one another. But there are two means of reaching an approximate conclusion as to their relationship. One way is to make the comparison on the basis of counties. It may well be objected that such an averaging of Poor

9. The Minister of Health discussed this matter in his Annual Report for 1920–21 (p. 125), and for 1921 (p. 137) and 1922 (p. 97), the gist of his argument being summed up in his statement: "These variations suggest that the extent of out-relief was determined rather by the system of administration adopted by the Guardians than by the extent of local distress." See also Sidney and Beatrice Webb, History of the Poor Law, ii, 905.

Law Unions obscures their differences, but an argument may be made in favor of the procedure in that under the 1928 law the county is made the unit for Poor Law administration.  Such a comparison of the January 1, 1927, figures is shown in Table III.

It will be seen that among groups of counties showing much the same amount of unemployment, there was wide variation in the proportion of men given poor relief because they were unemployed.  Table IV summarizes the data of Table III and shows the situation more clearly.

The line of perfect positive correlation runs from the group of 0–20 men given poor relief when unemployment stood at less than 6 per cent, to the over-200 group when there was over 17 per cent unemployment. Allowing a deviation of one step on either side of that line, there are still six counties in which there was a striking dissimilarity between the amount of unemployment and the number of men granted poor relief.  Two counties — London and Warwick — show low unemployment and high rates of relief.  Four show high unemployment and low rates of relief: Shropshire, Southampton, Worcester, and Chester.  In general the situation was just that: there were more counties with little relief and high unemployment than the reverse.

Table III is misleading in one respect, however. Since agricultural laborers are not insured, the rates of unemployment are probably not accurate in rural counties.  The only available count of the number of unemployed per unit of population is that shown in a report on urban areas which has been made annually since 1927 by the Ministry of Health.[1]  It shows for these

1. Unemployed Persons in Receipt of Domiciliary Poor Relief in England and Wales during the Week Ending June 16, 1928, Cmd. 3218. There is a similar return for 1927 and for subsequent years.

## TABLE III

PERCENTAGES UNEMPLOYED COMPARED WITH PROPORTION
OF POPULATION RECEIVING POOR RELIEF BECAUSE OF
UNEMPLOYMENT

(BY COUNTIES [1] — JANUARY 1, 1927 — ENGLAND AND WALES)

| County | Men relieved per 10,000 adult males | Percentage of insured men unemployed |
|--------|------------------------------------|--------------------------------------|
| Peterboro | 0 | 3.1 |
| Buckinghamshire | 4 | 4.3 |
| Hertford | 19 | 4.9 |
| Bedford | 4 | 5.1 |
| Leicester | 26 | 5.4 |
| Berkshire | 32 | 5.6 |
| Surrey | 9 | 5.8 |
| Sussex | 25 | 5.8 |
| Cambridge | 5 | 6.2 |
| Kent | 22 | 6.4 |
| Oxford | 9 | 6.7 |
| Huntingdon | 0 | 6.8 |
| Middlesex | 48 | 7.1 |
| Westmoreland | 3 | 7.1 |
| Derby | 21 | 7.6 |
| London | 127 | 7.9 |
| Dorset | 9 | 8.4 |
| Dorset | 9 | 8.4 |
| Nottingham | 72 | 8.6 |
| Wiltshire | 3 | 8.6 |
| Somerset | 25 | 8.8 |
| Warwick | 189 | 8.9 |
| Northampton | 28 | 9.0 |
| Southampton | 19 | 10.1 |
| Essex | 183 | 10.7 |
| Cornwall | 21 | 12.1 |
| Shropshire | 5 | 12.1 |
| Lincoln | 69 | 12.5 |
| Stafford | 69 | 12.6 |
| Norfolk | 74 | 12.7 |
| Gloucester | 208 | 13.0 |
| Worcester | 37 | 13.1 |
| Lancaster | 282 | 14.0 |
| Yorkshire | 180 | 14.0 |
| Chester | 41 | 14.9 |
| Cumberland | 166 | 15.9 |
| "Other counties in Wales" | 60 | 16.2 |
| Carmarthen | 73 | 17.2 |
| Northumberland | 369 | 22.8 |
| Glamorgan | 539 | 25.6 |
| Monmouth | 473 | 29.6 |
| Durham | 665 | 29.8 |

[1] Unemployment figures by counties from Local Unemployment Index, issued to subscribers by the Ministry of Health.

areas the number of persons per 10,000 population given
poor relief for unemployment, compared with the num-
ber of unemployed insured per 10,000 population.
Table V summarizes the 1928 return.

There is a definite relation between the number of
persons relieved and the number of unemployed; yet

TABLE IV

DISTRIBUTION OF ENGLISH AND WELSH COUNTIES BY THE
PROPORTION OF MEN RECEIVING POOR RELIEF BECAUSE
OF UNEMPLOYMENT AND THE PERCENTAGE OF INSURED MEN
UNEMPLOYED — JANUARY 1, 1927

| Unemployment percentages | Number of men per 10,000 adult male population granted poor relief because of unemployment | | | | | |
|---|---|---|---|---|---|---|
| | 0–20 | 21–50 | 51–100 | 101–200 | over 200 | Total |
| under 6 .... | 5 | 3 | . | . | . | 8 |
| 6– 8...... | 7 | 4 | 1 | 2 | . | 14 |
| 9–12...... | 2 | 2 | 3 | 1 | . | 8 |
| 13–17...... | . | 2 | 2 | 2 | 2 | 8 |
| over 17 .... | . | . | . | . | 4 | 4 |
| Total... | 14 | 11 | 6 | 5 | 6 | 42 |

there are again certain areas that are very strict in the
granting of relief and others that are very lax. The lax
area in Table V was East London, with 93 per 10,000
population given poor relief and 271 per 10,000 popula-
tion unemployed. The strict areas and their corre-
sponding figures were: Barnsley — eight relieved and
535 unemployed; Wigan — 32 relieved and 600 un-
employed; North Staffordshire — 11 relieved and 725
unemployed. The 1927 figures showed the same areas
having disproportionate amounts of relief and unem-
ployment.

It would seem, then, that, while a few Boards are
lenient in the administration of the Poor Law, more are

very strict and grant very little relief in spite of high rates of unemployment. Nor do the number relieved in the lenient areas account to any large extent for the size of the total figures. On January 1, 1927, the day shown in Tables III and IV, there were 175,447 men in receipt of poor relief because of unemployment. Only

TABLE V

DISTRIBUTION OF URBAN AREAS IN ACCORDANCE WITH THE AMOUNT OF UNEMPLOYMENT AND NUMBER OF UNEMPLOYED PERSONS GIVEN POOR RELIEF IN THEM ON JUNE 16, 1928

| Persons given poor relief for unemployment per 10,000 population | Number of insured persons unemployed per 10,000 population | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 7 00 | 750 | Total |
| 10 | . | . | . | . | . | . | 1 | . | . | 1 | 1 | . | . | . | 3 |
| 20 | . | . | . | . | 1 | 5 | . | . | . | . | . | . | . | 1 | 7 |
| 30 | 1 | 1 | 1 | . | . | . | 1 | . | . | . | . | . | . | . | 4 |
| 40 | . | . | . | . | . | 1 | 1 | . | . | . | 1 | . | . | . | 3 |
| 50 | . | . | . | . | . | 1 | . | . | . | . | . | . | . | . | 1 |
| 60 | . | . | . | . | . | . | . | 1 | . | . | . | . | . | . | 1 |
| 70 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| 80 | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | 1 |
| 90 | . | . | . | . | . | . | . | . | 1 | . | . | . | . | . | 1 |
| 100 | . | . | . | . | 1 | . | . | . | . | . | . | . | . | 1 | 2 |
| Total ... | 1 | 1 | 1 | . | 2 | 7 | 3 | 1 | 2 | 1 | 2 | . | 1 | 1 | 23 |

30,282 of them lived in the counties — London, Warwick, and Essex — in which poor relief was high and unemployment relatively low. So there would have been at least 145,165 such men relieved even if there had been no lenient Boards. The great increase in Poor Law numbers during the present depression period cannot, therefore, be attributed to any large degree to a too generous interpretation of Poor Law policy.

## III

It has been shown that the total number of unemployed persons in receipt of Poor Law relief varied not only with the amount of unemployment but with the character of the unemployment insurance acts; and further that the height to which those numbers have risen during the depression period cannot be adequately accounted for on the basis of too lax administration of the Poor Law. The next question to be considered is to what extent the Poor Law and the insurance system overlap. How many unemployed persons receive both types of aid? Why do some need such double financial assistance? How many insured persons seek Poor Law relief after being denied insurance benefits? In other words, can the height of the Poor Law figures be laid to an inadequacy in the insurance benefit scale or to regulations of the insurance law which deny benefits to some unemployed insured persons?

Tables I and II showed the total number of unemployed and their dependants in receipt of outdoor poor relief. Since February, 1927, more detailed figures are available, which indicate that not all of this group were insured. (Table VI.)

These figures divide the unemployed into three categories: the insured, those not insured but registered at the employment exchanges, and those who are described as being "ordinarily engaged in work." This last group includes persons on strike as well as those neither insured nor registered at an exchange. The insured and their dependants constituted well over half of the persons given poor relief because of unemployment. During the period shown in Table VI the number of such insured persons was reduced by more than 50 per cent, altho the numbers in the other categories

remained relatively constant. This change was probably
due to the removal of the discretionary power of the
Minister of Health and the lightening of the conditions
for the receipt of benefit which were brought about by
the Insurance Act of 1927.

TABLE VI

CLASSES OF UNEMPLOYED PERSONS IN RECEIPT OF OUTDOOR
POOR LAW RELIEF

(Average weekly numbers in thousands for the month stated)

| Date | Un-employed insured | Their depend-ants | Not in-sured but registered at ex-changes and their dependants | Ordinarily engaged in work and their de-pendants | Total |
|---|---|---|---|---|---|
| 1927 | | | | | |
| February......... | 126 | 303 | 43 | 108 | 580 |
| June............. | 106 | 259 | 36 | 88 | 489 |
| August.......... | 102 | 252 | 33 | 90 | 477 |
| November........ | 101 | 255 | 34 | 91 | 481 |
| 1928 | | | | | |
| February......... | 101 | 263 | 35 | 96 | 495 |
| May............. | 84 | 222 | 31 | 97 | 434 |
| August.......... | 71 | 192 | 28 | 94 | 385 |
| November........ | 69 | 186 | 36 | 96 | 387 |
| 1929 | | | | | |
| February......... | 75 | 205 | 40 | 113 | 433 |
| May............. | 57 | 155 | 35 | 111 | 358 |
| August.......... | 55 | 148 | 36 | 108 | 347 |
| November........ | 54 | 145 | 40 | 108 | 347 |
| 1930 | | | | | |
| February......... | 57 | 151 | 41 | 120 | 369 |

There were thus in February, 1930, about 57,000 in-
sured persons receiving Poor Law aid because they were
unemployed. What proportion of them were drawing
insurance benefits as well is unknown. The only avail-
able information on the amount of overlapping between

the two systems is contained in the "sample studies" [2] of the Ministry of Labour, which describe for certain days the situation of a representative group of claimants to unemployment insurance benefits. Table VII summarizes the data given in these studies.

### TABLE VII

PERCENTAGES OF CLAIMANTS TO UNEMPLOYMENT
INSURANCE BENEFIT IN PERSONAL RECEIPT
OF POOR LAW ALLOWANCES

| Date of sample studies | Men | Women |
|---|---|---|
| November  5–10, 1923 ...................... | 10.3 | 0.8 |
| November 24–29, 1924 | | |
|     Claims allowed ................... | 4.6 | 0.3 |
|     Claims not allowed ................ | 7.6 | .. |
|     Total ........................... | 4.7 | 0.3 |
| | | |
| April 4–9, 1927 | | |
|     Claims allowed ................... | 2.4 | 0.3 |
|     Claims not allowed ................ | 29.8 | 2.0 |
|     Total ........................... | 4.7 | 0.5 |

The 1923 study did not indicate whether or not the claims to benefit were allowed, but it showed that 10 per cent of the male claimants were receiving poor relief at the time they applied for insurance benefit. A year later this proportion had dropped to 4.7 per cent. This may have been due to the fact that the scale of insurance benefits had been raised from fifteen to eighteen shillings a week for a man and from one to two shillings a week for each dependent child.

The proportion in receipt of poor relief was higher among those whose claims to benefit were not allowed.

2. Investigation into the Personal Circumstances and Employment History of the Claimants to Unemployment Insurance Benefit, Parliamentary Papers published by the Ministry of Labour for the dates, November 5–10, 1923, November 24–29, 1924, and April 4–9, 1927.

This difference between the two groups was much sharper in 1927, when but 2.4 per cent of those whose claims were allowed were in receipt of poor relief, as contrasted with nearly 30 per cent of those whose claims were not granted. The sample studies, therefore, sug-

TABLE VIII

RELATION OF THE UNEMPLOYED INSURED IN RECEIPT OF
POOR RELIEF TO OTHER CLASSES OF THE UNEMPLOYED
INSURED

(Approximate numbers in thousands)

| Date | a<br>Total un-employed insured | b<br>Unemployed insured receiving poor relief [2] | c<br>Unemployed insured receiving insurance and poor relief [3] | d<br>Percent-age of b in Column c | e<br>Percent-age of a in Column b |
|---|---|---|---|---|---|
| November, 1923 | 1,250 | 148 (Dec.) | 89.4 | 60 | 12 |
| November, 1924 | 1,233 | 95 (Dec.) | 38.8 | 41 | 7 |
| April, 1926 [1] | 905 | 119 (Apr.) [4] | 34.4 | 28 | 13 |
| April, 1927 | 1,045 | 108 (Apr.) | 18.8 | 17 | 10 |
| February, 1930 | 1,500 | 57 | not known | .. | 4 |

[1] These figures in this row were given by the Minister of Health in a statement to the Committee on Unemployment Insurance in 1927. " Minutes of Evidence," p. 243.
[2] Estimated from the Quarterly Reports on Persons in Receipt of Poor Law Relief published by the Ministry of Health. The returns grouped together the insured persons and their dependents. Allowing 2.4 dependants to each insured person (the proportion shown in later figures), the numbers in this column were arrived at.
[3] Figures for 1923, 1924, and 1927 from the " sample studies " previously referred to. (See footnote 2, p. 282.) Figures for 1926 as indicated in footnote 1.
[4] This figure was given by the Ministry of Labour in A Memorandum on Certain Points Concerning Statistics of Unemployment and Poor Law Relief, 1927, Cmd. 2984.

gest several conclusions: (1) that there was not a great amount of overlapping between the unemployment insurance system and the Poor Law; (2) that the amount of overlapping was, in 1927, growing less; and (3) that a considerable proportion of the unemployed insured persons looked to the Poor Law for support because they were denied insurance benefits.

The question of the amount of overlapping between the two systems is approached from another angle in

Table VIII. In this table the number of unemployed insured who received poor relief is compared with the number who received both poor relief and insurance benefits and with the total number of insured who were unemployed.

Column $e$ corresponds roughly to Table VII, both being estimates of the proportion of insured persons in receipt of Poor Law relief. The difference between the estimates may be due to the fact that Table VII deals with the claimants to benefit while Table VIII covers all insured who were unemployed, whether eligible for benefit or not. Column $e$ does not show the downward trend which Table VII suggests but demonstrates rather that there was, up to 1927, a rather constant group of insured persons out of work and aided by the Poor Law.

Column $d$ suggests that as the years went by there was less and less overlapping between the two systems: in other words, that the Poor Law was not so much supplementing the inadequate insurance benefits of a large group of unemployed insured persons, but was rather the only support of an increasingly larger proportion of such persons. In April, 1927, they numbered about 90,000.

A partial explanation of this decrease in the amount of overlapping between the insurance system and the Poor Law probably lies in the insurance act, which in August, 1925, restored to the Ministry of Labour discretionary power in regard to the granting of extended benefits. What the situation is at present is unknown. The number of unemployed insured in receipt of poor relief changed from the 108,000 in April, 1927, to 57,000 in February, 1930. Ministerial discretion has again been removed and the conditions for the receipt of benefit have been altered in favor of the unemployed. It seems not unlikely, therefore, that the present group

of 57,000 may contain a higher proportion of persons receiving both relief and insurance benefits than was shown in April, 1927.

Descriptive data regarding the group of persons who receive aid from both the Poor Law and the Unemployment Insurance Fund are meager. All that is known about them is contained in a few tables in the "sample studies." [3] In those studies such persons were divided into classes according to the amount of their benefit (an index of the number of their dependants), their age, and their degree of "employability." The conclusions of all three studies were the same. The benefit group showing the highest percentage of its members in receipt of poor relief was that composed of men with a wife and from one to four children dependent upon them. They received poor relief ranging from ten shillings to two and sixpence a week.

The division of the insured into age groups bears out the same conclusion — that a large part of the need for additional aid from the Poor Law is occasioned by the presence of dependants; for it is the thirty to forty-five year old group which shows the largest proportion in receipt of poor relief. The facts as to employability support the same conclusion, in the opinion of the writers of the studies. More of the men placed in the upper than the lower classes of employability were in receipt of both relief and insurance benefits. This was explained as being due to the fact that the men in the lower categories of employability were more frequently old and had no dependants. The overlapping of poor relief and unemployment insurance seems thus to be due to the benefits not being sufficiently large to cover the support of dependants.

3. See footnote 2, p. 282.

Further evidence in favor of this conclusion is given in a special return from the Guardians of the Poor in April, 1926.[4] It showed that persons receiving both insurance benefits and poor relief belonged to families averaging 4.5 members, while those receiving only insurance benefits had but 3.3 persons in their families. Bowley [5] came to the same conclusion in his study of poverty in several English towns. He says:

> The unemployment benefit is generally sufficient if one or more other members of the household are employed; in particular if a young man is living with his parents; but, when the sole earner in a family is unemployed, Poor Relief is necessary, if savings are exhausted; but if, for example, when unemployment is not prolonged, the payment of rent can be postponed, then a man who normally received good wages can keep above the line.

It may be said, then, in answer to the questions with which this section started, that the unemployed insured persons in receipt of Poor Law aid are of two types: those who, for one reason or another, are denied benefit, and those whose benefit is inadequate for the support of themselves and their dependants. Between 1923 and 1930 the two groups combined constituted from 4 to 13 per cent of all the insured who were unemployed. In 1923 a very large proportion of the unemployed insured who were aided by the Poor Law were receiving insurance benefit as well. By 1927 much of the overlapping had disappeared; but the present ratio between the groups is unknown.

What is probably the chief reason for the overlapping of poor relief and unemployment insurance is revealed in the sample studies' description of the class of persons receiving such double relief. The studies showed that the group was composed largely of men, thirty to forty-

4. Report of the Unemployment Insurance Committee, 1927, "Minutes of Evidence," p.43.
5. Bowley and Hogg, Has Poverty Diminished? p. 15.

five years old, of a high degree of employability, who had several persons dependent on them for support.

Most of the demand on the Poor Law for the relief of the unemployed was occasioned, however, not by the persons who thus needed additional aid but by the group of insured who were disqualified [6] for the receipt of insurance benefit. In the final analysis, the chief reason for the present height of Poor Law relief figures must probably be laid to the fact that the insurance law does not cover all unemployment.

To summarize, then, the present economic depression in England has been distinguished from previous depressions by an enormous demand on the Poor Law for the aid of the unemployed, in spite of the fact that a wide unemployment insurance system has been in force since the beginning of the period. Radical changes in the insurance scheme considerably reduced the number of unemployed insured persons seeking Poor Law support; but even at present, when benefits are paid as of right to all insured persons genuinely out of work, the latest figures show 57,000 insured in receipt of Poor Law aid. While this situation may be due in part to laxness in the distribution of poor relief, it can be more adequately accounted for by the fact that insurance benefits are not large enough to cover the expenses of large families during long-continued unemployment, and that many unemployed insured are, for one reason or another, still refused benefit. Compared with the unemployment

6. Benefit can be denied on the ground that a claimant does not show a reasonable period of past employment, that he is not making a reasonable effort to obtain employment, or that he is not willing to accept reasonable employment. Ministry of Labour Gazette, May, 1927, p. 190.

See also Report of the Unemployment Insurance Committee, "Minutes of Evidence," 1927, p. 117.

figures, the number of insured in receipt of poor relief is not large; but compared with the number of other Poor Law charges, the figure is enormous. That it would be much larger were there no unemployment insurance system is undeniable. But that unemployment insurance, as it exists in England today, has solved the question of support of the unemployed during severe depressions is still debatable. It would seem, however, that the question could be solved by unemployment insurance if the benefit scale took more cognizance of dependants and if there were fewer grounds on which insurance could be denied.

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# A NEGLECTED PHASE OF TARIFF CONTROVERSY

## SUMMARY

I. The Australian Tariff Committee's report and free trade theory, 289. — The expansion of primary production, 290. — The tariff and the growth of population in Australia, 293. — II. Marshall's doctrine of increasing and decreasing returns, 295. — The tariff and land values, 296. — The tariff as a method of reducing the severity of decreasing returns, 297. — III. Patten's case for protection, 299. — The conditions necessary for its application, 302. — IV. The limits of economic protection, 305. — V. The expediency of the tariff as a method of subsidizing industry, 306.

## I

In 1927, the Prime Minister of Australia (Mr. S. M. Bruce) appointed an informal committee of economists to undertake an enquiry into the economic effects of the Australian tariff. The report of this committee was published in July, 1929.[1] Apart from the analysis of the important data bearing on the tariff problem in Australia, it revives an interesting but neglected phase of the tariff controversy. In reviewing the report in the Economic Record [2] Professor Jacob Viner remarks that the conclusion of the committee "rests essentially on two considerations which the free trade theory, whether rightly or wrongly, has not as a rule attempted to face." He further states: "the authors have made out a stronger case for their position than I would have supposed possible before reading their report, and I not only regard their investigation as well worth the great

1. The Australian Tariff: An Economic Enquiry, by J. B. Brigden, M.A., D. B. Copland, M.A., D.Sc., E. C. Dyason, B.Sc., B.M.E., L. F. Giblin, M.A., and C. H. Wickens, I.S.O., F.I.A., F.S.S. Hon. M.S.S. (Paris).
2. The Economic Record, the Journal of the Economic Society of Australia and New Zealand, Nov., 1929. Melbourne University Press.

amount of effort which it must have cost, but deserving further extension and refinement." Professor Viner does not accept the main conclusions of the report concerning the effects of protection on Australia, but it is relevant to the purpose of this article to quote his remarks on the relation of the report to the economic theory involved. For my own part I must admit that the conclusions at which the committee eventually arrived were not what I had anticipated, and I am in agreement with Professor Viner when he states that free trade theory had not attempted to face certain questions very relevant to the application of protection to a country with resources like those of Australia. This is probably due to two facts. In the first place, free trade theory has been greatly influenced by traditional arguments as developed by the classical school in Great Britain. Secondly, the argument for protection has usually been exaggerated, and the conditions which give them poignancy in Australia have probably not been found in any other country at any stage of the tariff controversy. Yet the Australian conditions are almost exactly the converse of those which gave point to the free trade argument in Great Britain during the first half of the last century, and it is rather remarkable that economic literature contains so little reference to the possibility of protection being economically sound under such conditions.

The Australian committee found, after careful analysis of the cost of protection, and the distribution of this cost among sheltered, protected and export production, that the increase in costs in export production caused by the tariff was 8 per cent. This figure was reached after making allowance for the assistance rendered to export production by subsidies. In estimating the effects of the tariff upon the national income, the central question considered by the committee was this: in the absence

of a tariff would export and other production have expanded sufficiently to contribute to total income the same amount as the protected production developed behind the tariff? If not, the tariff has been instrumental in securing a greater development of resources than would have been possible without the tariff. The answer to the question involved a consideration, on the one hand, of the amount of protected production that would not survive without a tariff, and, on the other, of the probable development of export production if costs were lowered by 8 per cent. On the whole, the answer was in the negative: "Generally owing to the quality of our uncultivated land," runs the conclusion on this point, "and the effect of increased exports on the market we are satisfied that the same average income for the same population could not have been obtained without protection." [3]

It was, therefore, considered extremely unlikely that the national income of Australia under free trade conditions would have been as great, *given the same standard of living.* The committee in no way denies the free trade position that the development of "natural production" without tariff assistance would have given a greater income per head for a smaller population. On *economic* grounds there is, of course, no special virtue in a large population, but for political reasons it is essential that Australia should absorb population as quickly as her resources will allow. The committee was not impressed with the usual argument for protection that it "creates" employment. Its central conclusion that the tariff had

3. See the report, p. 5. In Parts IV, V, and VI, the argument leading to this conclusion is itself condensed, and this simple statement does not do justice to the report. It is inserted here to show the relation of the argument to theoretical discussions that are reviewed in this article. The report, it should be added, severely criticizes and rejects the more familiar arguments for protection, and in Part VII discusses the effect of the tariff on the distribution of the national income.

actually given employment without reducing the standard of living was based upon somewhat novel but more solid grounds. The rapid development of agriculture in Australia is restricted by the climatic conditions, the distance from the markets of the world, the dispersion of favourable soils over a large continent and the cost of transport. After the settlement of the more favoured areas the costs of new settlement rose rapidly, and the finances of all the State governments have, in recent years, been adversely affected by the expenditures involved in maintaining certain services connected with the development of rural production. During the past six years, Australian governments have borrowed overseas approximately £30,000,000 per annum for developmental works, but the effects on primary production and on the absorption of population generally have not been satisfactory.[4] The opponents of the tariff would doubtless claim that the slower rate of expansion of primary production was one of the major effects of the tariff. But according to the analysis of costs made by the committee, primary production received £12 m.

4. Before the war Australian population was growing at a rate of approximately 2.25 per cent per annum, of which 1.75 per cent was due to natural increase and .5 per cent to immigration. Despite an ambitious post-war immigration policy, the rate of growth from the census of April 4, 1921, to June 30, 1929, was 1.75 per cent per annum, of which .55 per cent was due to immigration. But immigration has declined in the past two years and the rate of natural increase is also declining. The latter was 1.75 per cent in 1914, 1.5 per cent in 1920, 1.4 per cent in 1923 and 1.2 per cent in 1928. If the natural increase had remained at the pre-war level, the absolute increase in numbers from that source would today be 32,000 per annum greater, and this is roughly equivalent to the average net immigration. For the year ending June 30, 1929, the increase in population was only 1.4 per cent, of which .25 per cent was due to immigration. It is clear from these changes that the rate of economic progress in Australia will be less in the immediate future than it was either before or after the war. For a discussion of the population problem in Australia, see the articles by C. H. Wickens and J. B. Brigden in the Economic Record, vol. i, Nov., 1925, and P. D. Phillips and G. L. Wood, The Peopling of Australia (Melbourne University Press, 1928).

from the tariff and a further £12 m. from other assistance giving a total of £24 m. as compared with £26 m. of tariff subsidies to protect manufactures. Of course, the assistance to primary production was spread over a larger income,[5] and in tracing the incidence of the tariff it was shown that a considerable burden of net costs fell on the leading export (primary) industries. These industries were capable of considerable expansion had they been free of such costs, but it is erroneous to assume, as is often done in tariff controversies in Australia, that primary industries receive no benefits at present from the tariff or other methods of government assistance to industry. Despite a rather active policy of encouragement to primary production, it has not responded in a degree that would justify the assumption that its rate of expansion has been held back by the burdens of the tariff alone.

Comparing the three years, 1924–25 to 1926–27, with the years, 1911–12 to 1913–14, the employment of males in farming decreased by 5.5 per cent and increased in dairying by 26.3 per cent, in pastoral pursuits by 9.2 per cent, and manufacturing by 38.3 per cent. The increase in all rural production was only 4 per cent. It would be wrong to use these figures as a reliable measure of the absorption of population by each industry. Owing to changes in industrial organization such as the increased use of machinery on farms, the population supported indirectly by primary industries has doubtless increased, but this could not explain more than a fraction of the expansion of employment in the manufacturing industries. It is significant that the greatest expansion of employment in the primary industries is in dairying and sugar, both of which have benefited sub-

5. Export production was £150 m. and protected primary production £40 m., giving a total primary production of £190 m., compared with £110 m. for protected manufactures.

stantially from the tariff.  An analysis of the relation of
the increase in employment to tariff assistance for
manufacturing is made below, and it sustains the con-
clusion that those industries which have received the
greatest protection are on the whole those in which the
expansion has been most pronounced.  It is not sug-
gested that this result can be achieved with all exten-
sions of the tariff; indeed the comparison is made in
order to expose the limitations of the tariff as a method
of increasing the volume of employment.  That problem
was fully considered by the committee, who took a
serious view of the assumption in popular discussions in
Australia that there were no real limits to the use of the
tariff as a means of developing industry.  What is rele-
vant at this stage of the argument is to emphasize the
contrast between the costs of developing additional pri-
mary production and new manufactures.  Under Aus-
tralian conditions, both involve increasing costs per unit
of additional production, tho in some cases these higher
costs may be temporary and the industries may even-
tually be able to subsist without assistance.  It is this
aspect of the tariff question upon which the report of
the committee casts new light.  If, as seems established
by the investigation, it would have cost more to extend
production on the land than to have indulged in a
limited application of the tariff to manufacturing in-
dustry, the latter course was economically the sounder.[6]
Under such conditions, protection is to be regarded as a
permanent policy, tho the industries receiving benefit

6.  It may be argued that eventually the internal economies of primary
production through better organization would give lower costs over the
whole field of such production.  The judgment of the committee was that
such a development would not have been possible, and that for the period
under review, the exploitation of the *external* economies of secondary
production, even in the relatively limited Australian market, offered
greater advantages.

may be varied. The selection of such industries for tariff protection is a matter of administration upon which the committee laid down certain guides to action. Given a successful administration of the tariff, it can thus be defended on economic grounds in a country with economic resources like those of Australia.

## II

Tho this aspect of the tariff problem has never been adequately treated in economic literature, it has been touched on by certain writers. In his Presidential Address to the Economic Science and Statistical Section of the British Association in 1890,[7] where he discussed the attitude of British economists to the tariff, Marshall said:

They overlooked the fact that many of those indirect effects of Protection which aggravated then, and would aggravate now, its direct evils in England, worked in the opposite direction in America. For, firstly, the more America exported her raw produce in return for manufactures, the less the benefit she got from the Law of Increasing Return (i. e. that manufacture on a large scale is more economical than on a small); and thus her case was contrasted with England, who could manufacture more cheaply for her own use the more of her manufactures she sent abroad; and, for this and other reasons, a Protective tax did not nearly always raise the cost of goods to the American consumer by its full amount.

Both in this paper and in other passages in his works, Marshall gave a definite opinion against protection as applied in the United States, objecting that "however simple the plan on which a protective policy started, it was drawn on irresistibly to become intricate, and to lend its chief aid to those industries which were already strong enough to do without it." [8] The Australian tariff

7. See The Memorials of Alfred Marshall, pp. 26–32, and Official Papers by Alfred Marshall, "Memorandum on Fiscal Policy of International Trade," pp. 367–420.

8. Official Papers, p. 394.

is by no means free from such objection, and it remains yet to be determined whether the administrative problem can be satisfactorily solved.

Marshall's analysis of the effect upon fiscal policy of the operation of the laws of increasing and decreasing returns is of special interest to Australia and has been more fully developed by Professor Pigou. One of his leading conclusions is apposite to the present discussion.[9]

> These conclusions, taken in conjunction with what has been said in the preceding paragraphs, create a presumption in favour of State bounties to industries in which conditions of decreasing supply price *simpliciter* are operating, and of State taxes upon industries in which conditions of increasing supply price from the standpoint of the community are operating. They do not, of course, create a presumption in favour of fiscal interference with industries selected at haphazard or operated through rates of bounty or tax so selected. It is true that particular drugs consumed in particular quantities at particular times may cure diseases; but it is no less true that the consumption of drugs in general in a miscellaneous manner is highly injurious to health.

This has special force when applied to Australia.

The tariff burden falls most heavily on the export industries, and as these are primary industries it has kept the price of land lower than it would have been under free trade. Patten pointed out, in The Economic Basis of Protection, that the burden of a tariff falls on "natural monopolies." We may assume that the monopolies so described are those from which the products of the soil are obtained and that his doctrine was that the tariff, therefore, depressed the price of land. It may be looked upon as an indirect way of taxing rural lands to support manufacturing industries. On grounds of expediency and ease of administration, the policy of protection may be used to bring about this transfer of income. To levy direct taxes for the purpose of granting bounties to less profitable industries would be possible

9. Pigou, The Economics of Welfare, Part III, chap. 12.

only on a relatively small scale. Theoretically, the bounty system is preferable to import duties as a means of granting assistance to an industry, and the Australian Tariff Committee recommended its adoption under certain conditions.[1] But a comprehensive plan of protection cannot be developed and sustained under the bounty system. The "felt" burden of taxation is too great. Under the present protective system the assistance is obtained by an indirect tax which depresses land values by its effects on costs in the export industries. Hence the policy of protection may be regarded as in part attaining the ends for which the single taxers strive. A part of the unearned increment is used by the State to foster a policy believed to be in the social interests. Under free trade, there would be greater need for special land taxation; the tariff is now a means of taxing land. It is somewhat remarkable that most followers of Henry George in this country are ardent free traders, as was their great master.

The possibility of such action reducing the dependence of the country upon industries with increasing costs and of encouraging those with decreasing costs is also suggested in Professor Taussig's recent work on International Trade where the problem of varying industrial costs in relation to the development of trade is discussed.[2] After indicating the cumulative effects of "a comparative advantage in manufactured goods," Professor Taussig expresses the view that England had such an advantage during the first two thirds of the nineteenth century. He continues: "As time went on other countries entered the same paths, and they were probably aided in doing so by protective duties on their manufactures, that is, by deliberate action." Australian

1. See report, pp. 109–111.
2. International Trade, chap. 8.

experience is not quite parallel, tho we do not yet know
to what extent it will be possible to develop an export
trade in finished commodities. At present, the case for
protection stands rather upon the ground that the lim-
ited opportunity of increasing returns that the home
market offers for manufactures renders the protection of
some manufactures a less costly process than the devel-
opment of additional exports for the world market. It is
the steepness of increasing costs in the primary indus-
tries in Australia that gives such force to these con-
siderations. To some extent, the position is similar to
the illustrations given by Pierson[3] of the case of a coun-
try that found the production of food supplies for its
own rapidly growing population too costly because the
"new lands that have to be brought into cultivation
differ very much in quality and situation from those
previously in use." To develop her export trade Aus-
tralia would be forced to use such lands, and in Pierson's
words "it might be more advantageous not to bring any
new land into cultivation for the time being, but to de-
velop manufactures." Sidgwick also suggests such a
possibility, tho he considered his "extreme case an
improbable one."[4] But his example bears in some re-
spects a striking resemblance to the position in Aus-
tralia. He says:

Suppose a country (A) so thickly populated that additional agri-
cultural produce could not be obtained from the soil except at a
rapidly increasing expense; and suppose that one-third of its actual
produce of this kind — say, for brevity, its corn — is now consumed
by the persons engaged in its chief branches of manufacture. Sup-
pose that the country having been strictly protected adopts Free
Trade, and that consequently the manufactures in question are ob-
tained at half the price from another country (B) in exchange for
corn: and for simplicity let us assume that the result of the fall in

3. Principles of Economics, ii, 219.
4. Sidgwick, The Principles of Economics (Macmillan), p. 495.

price is that the same *total* price is paid for the manufactures an-
nually consumed. What then are the manufacturing labourers
thrown out of work by the change to do? The course most obviously
suggested by the circumstances is that they should emigrate and
supply the labour required in the extended manufactures of B, or in
the newly developed trade between A and B. If they do not do this,
there seems no general ground for assuming that they will all be able
to find employment in A, as remunerative as that withdrawn from
them. No doubt as the cost of production in agriculture may be
assumed to increase continuously, a certain amount of additional
labour may now be employed in agriculture which will be more
productive on the whole than some of the labour employed before
the trade was opened — the diminution in the amount of corn pro-
duced by each new labourer being more than balanced by the in-
creased power of the corn to purchase manufacture. But if the addi-
tional labour is only applicable at a rapidly increasing cost, the point
will very soon come at which this balance will be reversed: and it is
theoretically quite possible that a portion of the labourers thrown
out of manufacturing employment could not, in the present condi-
tion of industry, be employed in A in agriculture so as to yield any
surplus above their own consumption. And if they could not be
profitably employed in agriculture, it is theoretically possible that
they could not be so employed at all; so that the natural result of
Free Trade may be that A will only support a smaller, though
wealthier, population — the economic gain resulting from it to the
community as a whole being a gain which it would require violent
governmental interference to distribute so as to retain the labourers
thrown out of work.

The only substantial difference between the assumed
conditions and those prevailing in Australia is that the
point of steeply rising costs in agriculture has been
reached with a relatively small population and a high
standard of living.

## III

It was, however, the late Professor S. N. Patten who
most vigorously expounded the economic case for pro-
tection.[5] Patten contended that protection promotes

5. The Economic Basis of Protection (Lippincott). Patten was
greatly influenced by Carey's arguments for protection, especially the
latter's distinction between trade and commerce, his claim being that
diversity of employment follows upon the development of (internal)

national prosperity leading to an increase of population, and, therefore, to a greater demand for home produced goods and a more diversified production. With increased prosperity, however, there would be a demand for a great variety of articles, many of which would be imported. Therefore, protection would not discourage international trade. The difference between protection and free trade lay in the kind of foreign trade that would be developed. Under protection foreign trade would follow naturally from the increase in national prosperity that would be fostered by the tariff. The argument for an increase in prosperity was based upon novel premises. Patten made a distinction between the products of natural monopolies and commodities in general. In the early stages of the development of a country, the former were plentiful and cheap and the latter expensive. With the growth of population and the development of an export trade, the former (presumably food-stuffs and raw materials produced directly from the land) became costly. Their prices were fixed by the world market and tho they might be produced in great abundance within the country they would nevertheless be expensive to the domestic consumer. Meanwhile, other commodities would fall in price, presumably because of the growth of the import trade. National effort would be devoted mainly to the production of exportable food-stuffs and raw materials. This specialization would be carried to the point of excluding some non-exportable products for which the soil was eminently fitted. This would lead to an impoverishment of the soil, to recourse to inferior

commerce and the less clearly enunciated principle that under protection the prices of manufactured commodities fall while raw materials rise in price. For the last see Carey, Principles of Social Science, ii, 273, et seq. But his arguments have no bearing upon the economic case for protection as discussed in the Australian investigation.

soil and to an increase in rent. Hence the landowner would profit by the system of free trade, but the higher prices of food and raw materials would impose a burden upon the consumer, who would also suffer from the limited choice of domestic products available for him. The law of diminishing returns would be operating in a severe form and in the absence of the growth of manufactures the country would experience none of the beneficial effects of increasing returns. The growth of population would be retarded and the country would gain little from its cheaper supplies of commodities in general.

Protection would reverse this position. In the first place, it would foster the production of commodities in general, tho at higher prices. Population would increase, creating a demand for a more diversified production from the soil. This would actually improve the fertility of the soil, thus reducing the burden of diminishing returns on the land. The lessened dependence upon exportable produce from the land would reduce the prices of the products of natural monopolies, and thus lower rents. The average man would apparently be better off in that his food and basic necessities would, on the whole, be cheaper, while the expansion of production in secondary industry would bring into operation the law of increasing returns and thus cause a reduction in prices of goods which were produced at first under protection at a high price. "The burden of a protective policy falls upon those who are receiving their incomes from natural monopolies; while those who compete with one another upon the general market can obtain a higher value for their commodities in proportion as the protective policy has given a lower value to the products of natural monopolies." Under free trade a greater proportion of the national wealth is in the hands of the owners

of natural monopolies; under protection there is a more equal distribution of wealth.[6]

This is an attempt to paraphrase that part of Patten's argument that has a bearing upon the reasoning and conclusions of the Australian committee. Patten did not, however, refer to the effects of the laws of increasing and decreasing returns as such, tho their operation may be directly inferred from his general thesis. What now are the conditions under which Patten's case could withstand the usual criticism of protection? They may be enumerated as follows.

(1) Under free trade conditions the proportion of foreign to domestic trade must be high. If this were not the case, the prices of products of natural monopolies would not be greatly dependent upon export markets, nor would there be a concentration of effort upon relatively few such products. Only such a concentration and such direct dependence upon export markets would cause a rise in rents and make the burden of decreasing returns heavy.

(2) The population must be relatively small and the home market restricted. Otherwise there is an opportunity for diversified production from the land and also for the production of secondary goods on such a scale as would allow of the operation of the law of decreasing costs.

(3) The natural resources of the country must be relatively limited. Were this not the case, every in-

6. "Every commodity which is likely in the progress of a nation to become a natural monopoly has a higher value if it is exported than if the home market alone is supplied. Thus foreign trade causes the wealth of the country to be distributed in a different way from what it would be if there was no foreign trade of this kind. The classes gaining from the growth of natural monopolies have a greater share out of the total production of the nation than they would have if the natural resources of the country were used for the production of those commodities consumed at home." The Economic Basis of Protection, p. 40.

crease in population would reduce the average cost of production of manufactured goods and increase the opportunities of small scale agriculture, thus increasing income per head until the optimum population was reached. Ample and diversified natural resources permit population to grow rapidly under either free trade or protectionist conditions, and in fact the tariff has little influence on the whole.

(4) The pressure upon inferior soils must have reduced the standard of living. Otherwise, the products of labour would not, as Patten claims, be cheap. This pressure would cause a reduction in the standard of living only if there were no other opportunities for employing the population more profitably; that is, only if the above three conditions were in operation.

(5) Increased prosperity can be derived from the tariff only if it does not impose such a burden upon other producers as would cause them to restrict production. Patten admits there is a burden. It is found first in the higher prices of commodities in general, but he assumes that it is borne ultimately by the owners of natural monopolies, tho his reasoning here has many gaps. The position may be stated tersely. If the protected industries cost less than the extension of production in the old industries would have cost under free trade, the burden of protection is less than the "burden" of free trade. If the cost is greater, then protection does not offer any relief. On the contrary, it is a hindrance. As a corollary to this conclusion, it may be stated that in any case the relief offered by protection in this way is definitely limited by the fact that with few exceptions protected industries are restricted by the size of the home market, which under the conditions assumed must be itself restricted.

(6) Finally, the country concerned must have its

main export trade in the products of natural monopolies for the production of which it enjoys a comparative advantage for an output limited by its natural resources. Patten's argument could not be applied to a country like England where the export trade is comprised of secondary products, every extension of which is achieved at lower costs per unit of output.

Patten's case was based upon conditions in the United States. It is quite possible that the encouragement of secondary industry by the tariff at that time brought some gain to the country, and offered some relief from the pressure of decreasing returns upon the land. To say, however, that American population could not have grown to its present dimensions without the tariff is to ignore the richness and diversity of resources upon which the prosperity of the United States has been developed. Clearly, the conditions specified above are not applicable to the United States. Even in 1890, when Patten published The Economic Basis of Protection, the dependence of the United States upon foreign trade was not nearly as great as it is in Australia today; her population was six times as great as the present Australian population; her natural resources were known to be extensive, and they were greatly improved by the natural waterways and developing railroad system; there was no tendency towards a reduced standard of living through pressure of production upon inferior soils; and the rise of mass production was already giving the country an industrial leadership in certain secondary products that were entering the world's markets. If the conditions were not present in 1890, they are still less present today, when the United States is exploiting the economies of mass production in secondary industries more than any other country in the world.

## IV

Granted the theoretical soundness of a protectionist policy in a country with economic conditions similar to those operating in Australia, what are the limits to the application of a tariff? This point was fully considered by the committee, and in Parts IX and X certain guiding principles in administration were enunciated. The committee was impressed by the difficulties of sound administration; and it will be remembered that it was the maladministration of the tariff that caused Marshall to form an unfavourable opinion of the protective system in America.[7] It follows from the theory upon which the limited application of protection to Australia has been justified that each extension of the tariff increases costs in relation to benefits. At first, the industries with the *least comparative disadvantage* are developed, and here the costs are less than the equivalent development of primary industries with increasing costs. Normally, the industries to which protection is later granted will be more costly, and there are doubtless already many that are now more costly than the extension of primary industry. The committee recognized that the more costly of the protected industries might with advantage be eliminated. But it is very difficult to take away a tariff, and the immediate problem was to prevent uneconomic extension of protection. To expand employment still further in the secondary industries and thus meet the competition of imports for the Australian market would require additional doses of protection. These would inevitably be more costly than the protection given by the present tariff, and would, therefore, increase the burdens on the export industries. The committee expressed the view that "the costs of protection

7. See Official Papers, p. 394.

are dangerously high" and that "our available resources for subsidizing industry are at their maximum." Further: "These resources are now stretched as far as they will go in maintaining the standard of living for a growing population."

It must be remembered that the development of protection and other forms of subsidy to industry in Australia has been carried out under favourable conditions. For some years, overseas borrowing has been excessive, and thanks to high prices for wool the terms of international trade have been in favour of Australia. Under such conditions it is possible to sustain subsidies even to the less efficient industries without jeopardizing the standard of living. But this state of affairs has now changed fundamentally. Overseas loans in the immediate future will contribute little to the national income, and the price of wool has fallen so that the terms of trade are no longer in favour of Australia. The country has thus run into a period when its income available for subsidies will be reduced at the same time as it desires to increase subsidies for the purpose of maintaining the traditional rate of development.

## V

There are naturally many aspects of the tariff enquiry not mentioned in this review. I have attempted to confine attention to the central doctrine of the report and to relate it to general theory. Many baffling problems have been passed over. The committee itself recognized that it had merely touched on the fringe of some of these and it would welcome criticism from overseas students. There is, for example, the speculative question of the number of people, not workers alone, that a given amount of production will add to the population. This

problem was the subject of repeated discussion in committee. Free trade theory too often assumes that the natural development of industry will provide employment under conditions at least as good as those offered in the "less productive" industries that owe their origin to protection. This is an assumption that depends entirely upon the natural resources of the country.[8]

The Australian committee was concerned with the vital question: could Australia without a tariff have maintained the present population at the same standard of living? Assuming on the basis of its analysis that the alternative production would have been obtained by the extension of export production, it was found that there would be "substantially less population" (page 82). The distribution of national income would be altered, a considerable increase in rents and profits having occurred. It was estimated that £75 m. of protected production would be destroyed and in its place £47 m. of export production established, supplying the same real income at the lower level of prices. This export production would not support as much population as the displaced secondary production. Thus there would have been 750,000 population dependent on the protected industries, and at the new average of £90 per head only 520,000 people dependent on the new export production. The expenditure of the additional rents would, of course, increase the income in the sheltered industries, but this could not account for the additional 230,000 people. It may be argued that Australia is adopting an unsound

8. The question occurs in some recent British discussions on unemployment; e. g. Clay, The Post-War Unemployment Problem (Macmillan), where it is shown that employment has expanded most in the subsidized industry, but assumed that with certain economies of "rationalisation" industry generally could absorb the unemployment surplus. But Professor Clay casts doubts upon this assumption in his Presidential Address to Section F. of the British Association, 1929. See the Economic Journal, Sept., 1929.

course in "keeping" these extra people. True, on economic grounds it would be wiser to have the smaller population at a higher standard of living. But population in any country is seldom considered as a matter of economics alone, and Australia of all countries must pay close attention to the international issues raised by her relatively small population and her immigration policy. Granted this too, the economist might further argue that it would be more economical for Australia to proceed under free trade, and to subsidize the additional, say, 230,000 people from taxation to make up their income to the average. As Professor Viner remarks:

It [Australia] could have done just as well if it followed free trade and hired a number of persons, reaching with their dependants 230,000 by 1929, to dig holes in the ground and fill them again, and could have done even better if it put them to work at the standard wages building additional roads or parks, or trapping rabbits.

The answer is, of course, that such a course would have been politically impossible. Sharp increase of direct and indirect taxation would have been necessary. It was the political difficulty of raising the subsidies by taxation that inclined the committee to the view that in practice the same result could not have been achieved in that way. The political hostility to higher taxation and the avowed faith of the electorate in the tariff would clearly have upset any scheme whereby heavy subsidies were to be paid from revenue. The people will, however, support the tariff for the same purpose because it is a "method of painless extraction," and it is idle for economists to ignore such a fundamental fact.

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# THE READJUSTMENT OF WORKERS DIS-
# PLACED BY PLANT SHUTDOWNS

## SUMMARY

DESPITE much current discussion of the problem of
unemployment very little has yet been learned of the
extent, duration, and personal consequences of unem-
ployment. This is not strange in view of the expense of
field surveys and the inadequacy of the usual sample
eventually obtained. A contribution to the under-
standing of the situation has been made by the Institute
of Human Relations at Yale University, which has just
completed a survey, in line with other recent studies,[1]

1. The previous study most closely paralleled by this is the one by
R. J. Myers, Occupational Readjustment of Displaced Skilled Work-
men, Journal of Political Economy, August, 1929. This covered the un-
employment experiences of 370 cutters who had been eliminated from
the clothing industry in Chicago at some time during the period 1921–26
under conditions roughly similar to those existing in the rubber industry
in New Haven and Hartford in 1929. The similarity even included the
fact that the dismissal wage was a feature of both cases, while the funda-
mental difference turned on the time element: the New Haven and
Hartford cases on which this study is based involved permanent plant
shutdowns in which the entire working force was laid off at one time.

Another study comparable in many ways with this one was Isador
Lubin's The Absorption of the Unemployed by American Industry
(Brookings Institution pamphlet series, vol. i, No. 3, Washington, D.C.,
1929). In this case, too, the origin or cause of the unemployment was
much the same as that involved in the present study, but in addition to
the same factor of time difference noted above in Myers' study, there is
a further industrial difference in that Lubin's cases were not drawn from
any one industry. Nor were there any such readjustment aids as the
dismissal wage.

of more than 1200 industrial workers at a time approximately one year after their simultaneous layoff.

The Institute had considered the desirability of making such a survey but, being doubtful of its value, set up the minimum standards which it thought would justify the expense:

I. The possibility of an analysis of the pre-unemployment condition of the selected wage earners to insure,

   1. that the results of a survey would stand in their correct setting,

   2. that unemployment and unemployability would not be confused,

   3. the provision of a series of checks on the accuracy of any schedules or questionnaires used.

II. The limitation and definition of the problem to permit reasonably complete coverage.

III. The possible control of extraneous and incidental features.

Fortuitous circumstances created the situation which provided a case study along lines deemed satisfactory by the Institute. The United States Rubber Company inaugurated a thorogoing production reorganization which led to the permanent closing down of plants in various parts of the country. The first factory to be closed was the L. Candee Company, a rubber-footwear

A number of similar studies are now in process. The Department of Industrial Research of the University of Pennsylvania, under the direction of Prof. J. H. Willits, has a number of studies under way by Frank D. Watson and others.

Many unemployment studies have touched upon some of the points covered in this one. The sampling studies for measuring the volume of unemployment in various cities, such as those by the Croxtons in Columbus, Ohio, by the younger Croxton in Rochester, New York, by Dewhurst in Philadelphia, etc., have usually contained data on duration of unemployment. The frequent analyses of the applicants for jobs at employment offices contain much valuable information, while other analyses of charity organization records furnish data on a special type of unemployed. A recent example of the latter is that by E. L. Wilke in Boston, published in the Monthly Labor Review, September, 1930. Still another type of study is represented by Philip Klein's The Burden of Unemployment (New York, 1923).

manufacturing plant in New Haven, and this shutdown was followed in a comparatively short time by the closing of the Hartford Rubber Works, a tire factory in Hartford.

These shutdowns involved the permanent layoff of nearly 800 workers in New Haven and over 1100 in Hartford. Here was a situation that seemed to provide the essential requirements of the kind of study that the Institute was prepared to undertake. The access to the plant records made possible by the courtesy of the company provided the opportunity of meeting the first requirement set forth above.[2] The fact that these workers constituted two particular forces, each laid off from a single factory at the same time, met the second requirement. This study, therefore, is of a particular group of workers. It does not profess to be in any sense a study of a statistical sample of the unemployed. Finally, the fact that the situations in New Haven and Hartford, while generally similar, differed in certain important respects, permitted compliance with the third requirement. T e importance of these differences warrants their introduction at this point:

I. INDUSTRIAL CHARACTERISTICS
    1. Product: automobile tires (H) *vs.* rubber footwear (NH)
    2. Processes: mechanically modern (H) *vs.* old-style group work (NH)
    3. Management: geared to highly mechanized modern plant (H) *vs.* adjusted to group work and family relationships (NH)

II. COMPOSITION OF THE WORK FORCE
    1. Sex: practically all men (H) *vs.* 60 per cent women (NH)

2. The study was made possible by the coöperation of the United States Rubber Company. It should be unnecessary to state that, altho the company had a genuine interest in discovering the effects of its dismissal-wage policy, it had nothing to do with the conduct of the investigation and shares no responsibility for our interpretation of the results.

    2.  Nationality of workers: mixed (H) *vs.* 60 per cent Italian (NH)

    3.  Family status: many isolated single men (H) *vs.* family groups (NH)

    4.  Skill: highly skilled (H) *vs.* mostly semi-skilled (NH)

    5.  Wage rates: high wages, all groups (H) *vs.* wide range of wages (even for men) (NH)

III.  RESPONSE OF THE COMMUNITY TO THE SITUATION

    1.  Vigorous coöperative effort to help the displaced workers on the part of the city government, manufacturers' association, social agencies, etc. in Hartford; *vs.* passive and apathetic acceptance of conditions on the part of municipality and industry in New Haven.

The survey was undertaken for the purpose of answering questions such as the following: (1) What happened to the displaced workers — how long did it take them to find new jobs, what kind of jobs did they finally obtain, etc.? (2) How did they and their families meet the problem of unemployment — did non-wage-earning members of the family go out to hunt jobs, was the standard of living seriously lowered, how many had recourse to charity, etc.? (3) What similarities and differences in such results could be traced to the divergent situations in New Haven and Hartford? (4) Since the company had paid some of its workers a dismissal wage, one of the auxiliary purposes of the study was to investigate the effectiveness of this device in facilitating the readjustment.

The changed managerial policies of the company which led to these shutdowns has not been made an integral part of the present study. The fact of shutdown has been taken for granted as the starting point of the investigation. To provide a setting for the whole situation, however, it may suffice to state that, under the stimulus of new management, the company decided to concentrate its production in fewer, larger, more

highly mechanized and generally more efficient plants.[3]

Furthermore, this was not intended to be a study of the general causes of unemployment. It will be evident, of course, that we are here dealing with what is currently described as "technological" unemployment, because it resulted from the introduction of more highly mechanized[4] methods, and because the displaced workers had little prospect of being reëmployed in the same industry. It was quite impossible for the company itself to absorb any large proportion of them into its own expanding plants. The surplus workers (surplus in relation to the technological status of the time) were eliminated, and this took place so suddenly that it left them practically without hope of obtaining employment in the industry.

3. Those familiar with the history of the United States Rubber Company will recall that it was formed in 1892 as a loose combination of existing plants, many of which were taken over at high prices. Thus, at the very beginning of its career the company found itself saddled with excessive valuations and partially obsolete plants. Despite the progress which had been made in the course of four decades, the company was still, at the beginning of 1929, a rather sprawling, unwieldy concern. Early in 1929, to improve its general status, the company adopted the policy of closing subsidiaries wherever possible, and started with those in New Haven and Hartford. This has been pushed through almost to completion. In the circumstances the company found it necessary to dispense with even some plants of high efficiency, which by reason of location, etc., did not fit well into the reorganized scheme.

4. This is true particularly of the footwear manufacture. The nature of the material (elastic, sticky, etc.) and of the product (right *vs.* left shoes, etc.) for many years prevented the introduction of modern machine methods, and permitted until the last decade the survival of the old methods under which each worker made the entire shoe by hand. A few years ago the system of group work was introduced under which shoemaking was split into several processes performed by hand. Each shoe was then built up at one bench by a group of from two to four workers. This was the prevailing method in the New Haven plant at the time of closing. In the remaining plants, at the present time, a more intensive division of labor is being worked out to permit the application of the conveyor method.

## Sources

The data and materials for this study came from several sources.

I. Plant records furnished material regarding the worker with reference not only to the rubber company job but also to his previous employment history. They included miscellaneous information even about other members of the family. From these records [5] were obtained such data as:

| | |
|---|---|
| 1. Sex | 9. Absenteeism |
| 2. Age | 10. Kinds of jobs held |
| 3. Number and kinds of dependents | 11. Skill rating of jobs |
| 4. Nationality | 12. Worker's rating on job |
| 5. Citizenship | 13. Hours of labor, by weeks |
| 6. Education | 14. Earnings: weekly and annual totals |
| 7. Previous occupation and employer | 15. Amount of dismissal wage (if any) |
| 8. Length of service | 16. Amount of pension (if any) |

5. Factory records, altho they are the basic source of data for this type of statistical study, frequently present serious difficulties. In this case a great deal of the information was as of the date of hiring or of last re-hiring; thus any facts which might vary with time, such as the number and kinds of dependents, citizenship, etc., were subject to the danger of being out of date. Again, the management's appraisal of the worker, embodied in such records as previous employer, length of service, absenteeism, etc., was often incomplete to an uncertain and indefinite extent. Or, to consider still another aspect, management rules and definitions with reference to length of service, skill rating, etc., sometimes proved too rigid and formal for research purposes and had to be modified in order to obtain a better expression of the workers' point of view. Thus, length of service might be defined as (1) the entire period elapsed since the worker first joined the company, regardless of intermediate absences, (2) the total actual *working* time put in by the worker since he was first hired, or (3) the official company record of working time, counting only the period since the last break in service; the latter often falls far short of expressing the full period worked by the employee. Finally, of course, on some types of company ratings the standards were greatly relaxed at the time of closing, chiefly in those respects which might influence the worker's chances of getting a job. The foremen's grading on quantity, quality, attitude and attendance proved so high as to be unreliable.

II. Some of the displaced workers, either prior to or subsequent to the shutdown, had had contacts with various charity organizations, whose records were therefore examined for supplementary information.

III. A field survey of the workers themselves (in New Haven and Hartford) by means of personal interview yielded data on events following the shutdown. This survey took place nearly a year later in each case — long enough to allow for a thoro trial of the readjustment possibilities. The schedule for field work consisted of four main parts:

1. the employment history of the worker and his family as far back as could be obtained, but with special emphasis on the period since the shutdown;
2. the methods used by the workers in finding work;
3. changes in family living conditions since the shutdown, with reference to the number of persons in the household, housing accommodations, illness, insurance, and finance;
4. the use of the dismissal wage.

IV. Miscellaneous sources, such as periodicals, local newspapers, employment offices, or occasional personal interviews with community leaders, yielded much information on community aspects of the problem.

The New Haven plant was closed on April 6, 1929, displacing nearly 800 workers. The survey was conducted in March, April and May, 1930, the data being interpreted as of March 1, 1930. The Hartford plant closed at the beginning of September, 1929, and the survey during July to September, 1930, gave results as of July 1, 1930. No attempt was made in either place to cover foremen and other junior executives, and therefore the grand total (New Haven, 265 men, 464 women; Hartford 1093 men, 12 women) must be interpreted to mean number of displaced wage earners, exclusive of foremen, etc. It will be evident that in the tabulations

here presented the total most frequently used is that of the number of good schedules obtained.[6]

Classifications based on age and sex have been consistently maintained in practically all analyses made in this study. Occasionally, the distinction of one or both these factors turned out to be of minor importance, and in such cases the classification has been dropped in presentation; but in no case does this mean elimination of the distinction in analysis.

One of the most surprising results of the entire survey, which seems in itself to have considerable significance, was the difference in coverage in the two cities. Since the same investigators and the same methods were used in both places, this difference cannot be explained in terms of less effective field work, and may throw light on the relative mobility of labor in the two cities.

### GEOGRAPHICAL MOBILITY OF LABOR

There was a striking difference with respect to the degree of success in coverage between the field surveys in New Haven and Hartford. Good schedules were obtained from over 90 per cent of the New Haven workers, while in Hartford the corresponding figure is less than 50 per cent. These results, shown in Table 1, seem to indicate that the Hartford working force was decidedly more mobile. In the table the reasons for not

6. Occasionally the context will indicate a further restriction. It was not always possible to obtain complete information on a case. But it is also true that the type of analysis often involves the elimination of various irrelevant cases. To illustrate the combined influence of these two points, the male workers in New Haven will be found tabulated in various ways: total good schedules, 244; total actively seeking work, 228; total finding permanent work, 201; total reporting comparable weekly earnings on old and new jobs, 187; etc. For more detailed tabulation, see forthcoming monograph to be published under the auspices of the Institute of Human Relations.

obtaining schedules have been shown for Hartford, primarily for the purpose of bringing out the essential differences between that city and New Haven.

TABLE 1

SUMMARY OF CASES

(Total working force, classified by age groups, showing sample obtained)

| Age groups | NEW HAVEN | | HARTFORD | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total number on force | Good schedules | Total number on force | Good schedules | Schedules not obtained | | | |
| | | | | | Moved unknown destination | Unknown at address | Moved out of city | Miscellaneous* |
| *Total* | *729* | *672* | *1105* | *534* | *237* | *122* | *135* | *77* |
| 15–19 | 115 | 103 | 20 | 11 | 3 | 1 | 4 | 1 |
| 20–24 | 111 | 99 | 151 | 46 | 53 | 19 | 27 | 6 |
| 25–29 | 113 | 105 | 203 | 80 | 61 | 25 | 24 | 13 |
| 30–34 | 77 | 71 | 201 | 91 | 39 | 28 | 29 | 14 |
| 35–39 | 71 | 66 | 199 | 109 | 43 | 14 | 19 | 14 |
| 40–44 | 76 | 70 | 160 | 88 | 19 | 15 | 20 | 18 |
| 45–49 | 57 | 52 | 83 | 50 | 9 | 11 | 7 | 6 |
| 50–54 | 34 | 33 | 36 | 26 | 4 | 3 | 2 | 1 |
| 55–59 | 34 | 33 | 25 | 14 | 3 | 4 | 2 | 2 |
| 60–64 | 28 | 27 | 17 | 13 | 1 | 0 | 1 | 2 |
| 65–69 | 12 | 12 | 9 | 6 | 1 | 2 | 0 | 0 |
| 70–74 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |

* Miscellaneous includes 32 from whom interviews were not obtained because of their eccentric working hours, 38 not visited because they lived in outlying rural districts, and 7 lost through blunt refusal, general unreliability, and death.

Of the entire Hartford force, 135 were known to have moved out of the city, and it is probable that many of the 237 who had moved to an unknown destination actually did leave the city. It is also likely that many of the 122 "unknown at address" (often fictitious) were highly itinerant. When the address was not fictitious, they had at any rate not lived there long enough to become known in the neighborhood. In New Haven, on

the other hand, many of the 57 workers not scheduled were definitely known to be still in the city.

One of the obvious reasons for this difference is to be found in the sex composition of the working forces, which itself reflects an interesting contrast in the occupational status of women in the two cities.[7] The fact that over 60 per cent of the Candee workers were women would of itself have reduced the average mobility of this group, but in this particular case mobility was further reduced by the family composition of the working force. This plant was distinctly a "family concern" in the sense that many married couples worked there, and that many of the younger workers were directly related to the older. The management, as a matter of fact, had rather encouraged this development. For obvious reasons, this family constitution decreased the mobility of the men, and even of the younger workers. The importance of this factor was brought out clearly by the company's lack of success in permanently transferring even a few selected workers to another of its plants twenty-two miles distant.

The predominance of men in the Hartford plant might in itself be a sufficient explanation of the higher mobility of that group. However, an analysis of the percentage of "good" to "lost" schedules, classified by nationality, shows that the difference in the nationality composition of the two work forces may have been an accentuating factor.[8]

7. Nearly one third of the total industrial workers in New Haven are women, as compared with one fourth in Hartford (State of Connecticut, Department of Factory Inspection: List of Connecticut Manufacturers, 1929–30). In the latter the insurance business has attracted a larger proportion of gainfully employed women into clerical positions.

8. "Nationality" is the observed fact. We do not know to what extent it signifies a difference in the behavior of the racial groups. We infer that nationality is itself an indicator of "recency of immigration," which might reasonably be expected to affect willingness to move.

For the Americans, who constituted the largest single group (whites, 25 per cent, colored, 4 per cent of the total) in Hartford, the percentage of good schedules obtained was almost exactly in proportion to their numbers. The same rough equivalence was found for nearly all the racial groups except the French-Canadi-

TABLE 2

NATIONALITY OF WORKING FORCE

(Classified by place of birth and by schedules obtained)

HARTFORD

| Nationality | Number of workers | Number foreign-born | Schedules obtained |
|---|---|---|---|
| *Total*................ | *1105* | *619* | *534* |
| American white ......... | 275 | .. | 131 |
| French Canadian ....... | 165 | 108 | 48 |
| Italian ................ | 133 | 125 | 78 |
| Polish ................ | 110 | 90 | 67 |
| Irish ................. | 79 | 60 | 46 |
| Canadian .............. | 54 | 39 | 21 |
| Russian ............... | 41 | 39 | 21 |
| American colored ....... | 39 | .. | 23 |
| German ................ | 28 | 9 | 14 |
| Portuguese ............ | 28 | 28 | 8 |
| Lithuanian ............ | 27 | 24 | 13 |
| English ............... | 26 | 19 | 11 |
| Scotch ................ | 17 | 12 | 7 |
| Austrian .............. | 15 | 10 | 8 |
| Miscellaneous ......... | 68 | 56 | 38 |

ans, for whom only forty-eight schedules, out of a possible one hundred and sixty-five, were obtained. It appears that the French-Canadians comprise the most distinctively mobile section of the working population of Hartford. It would be unwise to infer from these statistics very much about the itinerant qualities of the French-Canadians as a racial group. It is probable that those in Hartford are the advance guard of an army of immigrants coming down from Canada and northern

New England. They may be surveying the land as scouts with the intention of returning later to settle in Hartford with wives and families.

The second largest group of mobile workers was the English-speaking Canadian, for whom only twenty-one out of fifty-four possible schedules were obtained. It is very probable that these two groups of Canadians are attracted by a period of prosperity and return home in time of depression. For this section of the country they may be taking the place of European immigrants who formerly provided a mobile labor reserve. Further study, however, would be required to establish the complete validity of this conclusion.[9]

The Portuguese group was small, but proved to be the most difficult of all to find. Altho they were all foreign-born, they had come to Hartford from Rhode Island and other eastern Portuguese centers, and are known to have returned for the most part when business conditions became poor.

That these three groups are the most migratory is substantiated by an analysis of those workers who moved to known out-of-town destinations. Of all French-Canadians and Portuguese in the factory, more than one quarter fall in this class. English-speaking Canadians rank next among the different nationalities with one sixth leaving Hartford for known destinations.

Mobility is, of course, affected by age; but since there was no outstanding difference in the age distributions of the two working forces, age does not explain the Hartford-New Haven contrast. However, in Hartford the three racial groups most mobile were concentrated in the lower age classes. Among all the workers of these three nationalities in the plant only eight individuals

9. In other sections Mexicans seem to do the same thing. See P. S. Taylor, *Mexican Labor in the United States* (Berkeley, 1927–30).

were above forty-five years. Of the Portuguese only
four were above thirty-five. Age is clearly a factor in-
fluencing the mobility of these groups, and this fact is
consistent with the previous inference that many of
them were "immigrant scouts."

In contrast to the above, the Candee plant in New
Haven contained practically no representatives of these
migratory nationalities. This fact — which itself is
explicable chiefly in terms of basic economic considera-
tions — supplements the preceding discussion of sex,
nationality, and age by introducing business conditions
as a significant factor in labor mobility. For some years
industrial New Haven has not been growing rapidly and
has not enjoyed a high degree of prosperity. After the
war-time expansion many of the city's leading firms
found themselves in a greatly over-expanded condition,
from which recovery has been slow. There has been
very little incentive for migrant industrial workers to
try their hand in the city in recent years; a curve of in-
dustrial employment has shown no appreciable upward
trend for some time. On the other hand, Hartford has
been notably prosperous for many years, and the last
boom (1928–29) brought about a significant increase in
the city's industrial wage-earning population. During
such a stage a community will attract "immigrants,"
and the analysis of the results of the survey shows that
this had happened here.

The service records at the Hartford plant indicate
that approximately 300 workers out of a total of 1100
had been on the payroll less than two years; and of
these 300 less than 30 were located for schedule pur-
poses in the field survey. When the depression came on,
and jobs could not be found, these "immigrants" (fre-
quently single men in the twenties and thirties) re-
turned to their former homes. The New Haven records,

however, make a very different showing. There were about 140 workers with less than two years' service, but over 60 per cent of these were youngsters under twenty years of age who were just beginning their industrial careers. Furthermore, these young boys and girls were nearly all New Haven residents, as is shown by the fact that all but a dozen of them were found and interviewed. When these very young workers are eliminated, only 50-odd short-service workers are left, and of these only ten were not successfully scheduled. The conclusion must be that New Haven in recent years has not been attracting migratory workers to any considerable extent, and therefore its working population is now stable and immobile.

It is of some interest, however, to note in the composition of the Candee working force concrete evidence of previous waves of immigration to New Haven. The facts are graphically portrayed in the accompanying chart. The age distribution and place of birth of members of these racial groups throw light on the history of New Haven's experience with working-class immigrants.

The Irish furnish the best example of this, in that no less than twenty-seven out of fifty were above fifty-five years of age, while only three lone members were under thirty-five. Forty years ago the Irish were dominant in the factory, altho, as shown by the proportion of native and foreign-born, they were not exactly an immigrant group at that time. However, with the coming of the Italians, and later of the Poles and Slavs, the Irish deserted the rubber industry, or at least carefully kept their children away from it. This was true also of the Germans. The heavy proportion of Italians and Slavs in the middle-age classes shows that these were first-generation immigrants, who took the place of the Irish

CHART I

LEADING NATIONALITIES IN NEW HAVEN PLANT CLASSIFIED BY AGE AND PLACE OF BIRTH

| Age group | ITALIANS | | POLES, LITHUANIANS, RUSSIANS | | AMERICANS INCLUDING COLORED | IRISH | | GERMANS | | MISCELLANEOUS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Foreign-born | Native-born | Foreign-born | Native-born | | Foreign-born | Native-born | Foreign-born | Native-born | Foreign-born | Native-born |
| 15-19 | | | | | | | | | | | |
| 20-24 | | | | | | | | | | | |
| 25-29 | | | | | | | | | | | |
| 30-34 | | | | | | | | | | | |
| 35-39 | | | | | | | | | | | |
| 40-44 | | | | | | | | | | | |
| 45-49 | | | | | | | | | | | |
| 50-54 | | | | | | | | | | | |
| 55-59 60-64 65-69 | | | | | | | | | | | |
| Pensions | | | | | | | | | | | |

and Germans. In recent years the force has been re-
cruited chiefly from the second (native-born) generation
of these "new" immigrant races and, in a surprisingly
large number of cases, even from the children of these
older Candee workers.

## Duration of Unemployment

Each plant was closed on about a month's notice and
preparation, during which time the management and
personnel department of the company directed their
energies to the problem of easing the transition of the
displaced workers. Those who were eligible (women
over fifty-five years of age, men over sixty, with suffi-
cient length of service) received a pension in accordance
with the long-established pension plan of the company.
Workers over forty-five years of age with ten years'
service, and also those under forty-five with fifteen
years' service, received a dismissal wage based upon
length of service and current weekly earnings. A few
workers were transferred to other plants of the com-
pany in more or less distant places. As for the re-
mainder, the company tried to place many of them in
various industrial concerns in the home city. It was
the theory of the company officials that the month's
notice and the accompanying easements assisted the
workers' "mental readjustment," while the dismissal
wage gave more tangible aid to some in their "economic
readjustment."

For practically all the workers involved in the shut-
downs, except the pensioners and the transfers, the
pressing and immediate problem was that of finding an-
other job. It is important, then, to see just what success
attended the efforts of these workers, aided by the com-
pany, the city government, industrial organizations,
and miscellaneous agencies. In Hartford only nine

workers (out of 534 interviewed) are recorded as not having looked for work, and 83 as not having found any.[1] A similar analysis for New Haven shows that no

### TABLE 3

LENGTH OF TIME NECESSARY TO FIND WORK

(Total number of workers seeking work and number finding first permanent job in two months or less, classified by age groups [2])

| Age groups | HARTFORD | | NEW HAVEN | | | |
| | | | Men | | Women | |
| | Total number seeking work | Number finding first job in 0, 1, or 2 months | Total number seeking work | Number finding first job in 0, 1, or 2 months | Total number seeking work | Number finding first job in 0, 1, or 2 months |
|---|---|---|---|---|---|---|
| *Total* | *523* | *305* | *228* | *140* | *358* | *231* |
| 15–19 | 9 | 5 | 23 | 17 | 77 | 58 |
| 20–24 | 45 | 25 | 18 | 10 | 75 | 54 |
| 25–29 | 80 | 53 | 26 | 17 | 72 | 47 |
| 30–34 | 90 | 56 | 28 | 19 | 33 | 24 |
| 35–39 | 108 | 62 | 23 | 15 | 35 | 14 |
| 40–44 | 88 | 50 | 32 | 29 | 30 | 18 |
| 45–49 | 50 | 28 | 30 | 15 | 17 | 8 |
| 50–54 | 26 | 14 | 19 | 11 | 10 | 5 |
| 55–59 | 13 | 9 | 15 | 4 | 1 | 1 |
| 60–64 | 8 | 3 | 6 | 2 | 1 | 0 |
| 65–69 | 3 | 0 | 1 | 1 | 0 | 0 |
| Pensions | 3 | 0 | 7 | 0 | 7 | 2 |

less than 84 (out of 672) did not seek work, while 68 were unable to find it. One of these differences is readily explained when the data are tabulated by sex,

1. Sometimes the dividing line between "never finding work" and "never looked" is a very hazy one. It was not always possible to take the word of the worker on that point, since observable factors occasionally spoke louder than words. However, the utmost care was used in making these distinctions, and in all cases we have leaned to the side of conservatism by putting in the "never looked" class everyone who could conceivably be classed there.

2. For detailed explanation of class division lines, see forthcoming monograph.

as they always are for New Haven. The women comprise the bulk of those not seeking work — 69 women as compared to 15 men. Sex seems, however, to have had little effect in determining job-hunting success.

A summary view of the duration of unemployment can be obtained from Table 3. This shows the relationships existing between the total number seeking work and the number who found it in an arbitrarily selected period of 0, 1, or 2 months — in other words, how many found work in a period of somewhat less than three months.[3]

On the whole there was little difference between the two sexes in respect to the time it took to find the first job; sex seems to be a negligible factor, but it is very clear that age is not. The marked success of the younger workers is shown for both sexes, while the handicap to workers over forty-five is equally apparent. Of all men over forty-five actively seeking work, only 43 per cent found jobs in the specified time, while of those under forty-five over 71 per cent were in this class. For the women the corresponding percentages are 44 and 67. The contrast between young and old is further sharpened if those who never succeeded in finding work during the survey period are taken into consideration. Of

3. Myers obtained results strikingly similar to these. Of his clothing cutters 29 per cent found work without appreciable loss of time while 51 per cent were at work in two months or less. Our figures for Hartford show that those finding work immediately also comprised about 29 per cent of the total number scheduled. For the full two months' period the percentages are: Hartford 58, New Haven men 61, New Haven women 64. Still another comparison shows that about 16 per cent of the Hartford workers failed to find work in a 10 months' period; for the Chicago cutters a similar calculation shows somewhat more than 10 per cent not finding work in 10 months. See Myers, op. cit., p. 479.

Lubin divides his workers into those who found jobs and those who were still unemployed at the time of the interview. Considering only the first group we find that Lubin's figures are 11.5 per cent finding work in less than a month and 44 per cent in less than three months. See Lubin, op. cit., p. 5.

the 28 men of all ages who failed in their quest no less than 22 were over forty-five years old.

In Hartford, variations with respect to age were quite different from those in New Haven. There is much greater uniformity among all age groups, and the sharp differentiation between youth and age is not in evidence. The best record was made by workers of 25–34 years, while the young men fell below the average. There is a noticeable downward tendency in the percentages of the older groups which cannot be obscured by the rather freakish performance of the group 55–59.

The two "sport" groups in New Haven — men 40–44 and women 35–39 — deserve attention. These men made the best record of any group, while the women of practically the same age had the worst luck of all. The factor concealed in this situation is that of occupation: the men held jobs which were similar to those in many other industries; the women were the old handicraft shoemakers, whose occupation disappeared with the new improved processes.[4]

Analysis of the data shows clearly that there was very little difference between Hartford and New Haven in the duration of unemployment. This is surprising in view of the much more aggressive and well-organized efforts made in Hartford by industry and the com-

4. E. D. Smith makes the point that the problem of the middle-aged worker in industry is not a matter of age but of obsolescence. He cites examples of even comparatively young workers whose training and experience have been so narrow that they have become inflexible and unadaptable. See E. D. Smith, What are the Psychological Factors of Obsolescence of Workers in Middle Age? (Personnel Series No. 9, American Management Association, New York, 1930.)

The skilled shoemakers mentioned in the text above had had very narrow, specialized training and they were probably the least adaptable group laid off in the shutdown. The extremely poor results achieved by these workers in finding satisfactory new jobs is ample demonstration of the point.

munity. Whereas New Haven, after a preliminary attempt to retain the plant had failed, made little organized effort as a community to place the workers, in Hartford well-conceived steps were taken to assist the workers in finding reëmployment. The local management there was successful in securing the coöperation of the Mayor's Unemployment Committee, which obtained part-time jobs in the city parks, etc. The County Manufacturers' Association also assisted by coöperating with the company in setting up an employment bureau in which rubber workers were given priority, and by having its secretary seek openings through telephone and personal interviews with most of the important manufacturing concerns in the city. Various public-utility concerns endeavored to provide openings, and one newspaper ran free advertisements for the ex-rubber-workers. The whole community united in vigorous efforts to place every displaced worker in some plant in the city or vicinity.

These efforts, strange to say, seem to have had little statistically observable effect. One explanation of this can be found in the state of business. Both shutdowns were timed to catch the seasonal expansion in trade, one in the Spring, the other in the Fall. The seasonal expansion in New Haven was largely counterbalanced by the slow cyclical decline of business which had already set in and which continued gently through the summer. The Hartford shutdown, however, ran squarely into a sweeping decline which quickly achieved the proportions of a major depression. It is probable that, without the powerful community coöperation instituted in Hartford, the unemployment experiences of the workers would have been much worse. At the same time, the cold facts embodied in the statistics cannot fail to furnish some evidence of the helplessness of good wishes in

the face of economic forces. Emergency programs, community goodwill, and all the other forms of co-operation did not, in this case at least, seriously modify the usual course of events.

A second way to view the problem of reabsorption of these workers is to consider the ultimate fate of the worker on his first permanent [5] job: Did the worker like the job so well, and was he so satisfactory in it that this one job was held straight through until the closing date of the survey? Or was there a severance of relations between employer and employee very soon after the hiring? The chief point of interest here is the number of workers who held the first job straight through. This is shown in the summary table below.

With respect to this point, sex differences seem again unimportant, altho in the two younger groups the women make a slightly better showing than the men. With reference to age, however, those under twenty-five years have considerably lower stability than the older workers of both sexes. Of the women finding work at all, 44 per cent held their jobs right through to the end, but the percentage for the two youngest age groups was about 36 as compared to about 50 for the remainder. It is scarcely conceivable that the latter were more adaptable to change, nor is it likely that the greater time required to find work resulted in any better choice of jobs. We shall probably be closer to the facts if we reason that the older workers, appreciating fully their more precarious position in the industrial world, clung to their jobs with more tenacity.

A third type of summary is developed in the analysis of the total time out of work throughout the survey period, computed as a weighted average. For this sum-

5. For definition of "temporary" and "permanent," see forthcoming monograph.

mary, allowance is made for all temporary jobs, since the object is to determine the actual amount of lost time.

These data disclose several important facts. First, the absolute figures on lost time in themselves are inter-

TABLE 4

LENGTH OF TIME ON FIRST PERMANENT JOB

(Total number of workers finding work at any time and number holding first permanent job through to the closing date of the survey, classified by age groups)

| Age groups | HARTFORD | | NEW HAVEN | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | | Men | | Women | |
| | Total number finding work at any time | Number holding first job through to closing date | Total number finding work at any time | Number holding first job through to closing date | Total number finding work at any time | Number holding first job through to closing date |
| *Total* | *525* | *253* | *201* | *100* | *319* | *140* |
| 15–19 | 9 | 2 | 22 | 7 | 72 | 29 |
| 20–24 | 45 | 20 | 18 | 5 | 72 | 23 |
| 25–29 | 80 | 46 | 23 | 13 | 63 | 35 |
| 30–34 | 91 | 41 | 28 | 13 | 30 | 13 |
| 35–39 | 109 | 54 | 21 | 11 | 26 | 12 |
| 40–44 | 88 | 46 | 32 | 17 | 25 | 10 |
| 45–49 | 50 | 20 | 26 | 15 | 16 | 9 |
| 50–54 | 26 | 13 | 13 | 6 | 9 | 5 |
| 55–59 | 13 | 6 | 9 | 6 | 1 | 0 |
| 60–64 | 8 | 2 | 4 | 3 | 1 | 1 |
| 65–69 | 3 | 2 | 1 | 0 | 0 | 0 |
| Pensions | 3 | 1 | 4 | 4 | 4 | 3 |

esting. For the entire working force in New Haven the average time lost was 4.38 months, or approximately 40 per cent of the available time over a period of 11 months. In the absence of comparative data we have no means of knowing whether this should be considered

CHART II

WORKING TIME LOST BY NEW HAVEN WORKERS DURING ELEVEN MONTHS'
PERIOD FOLLOWING SHUTDOWN

(Expressed in percentage of full time)
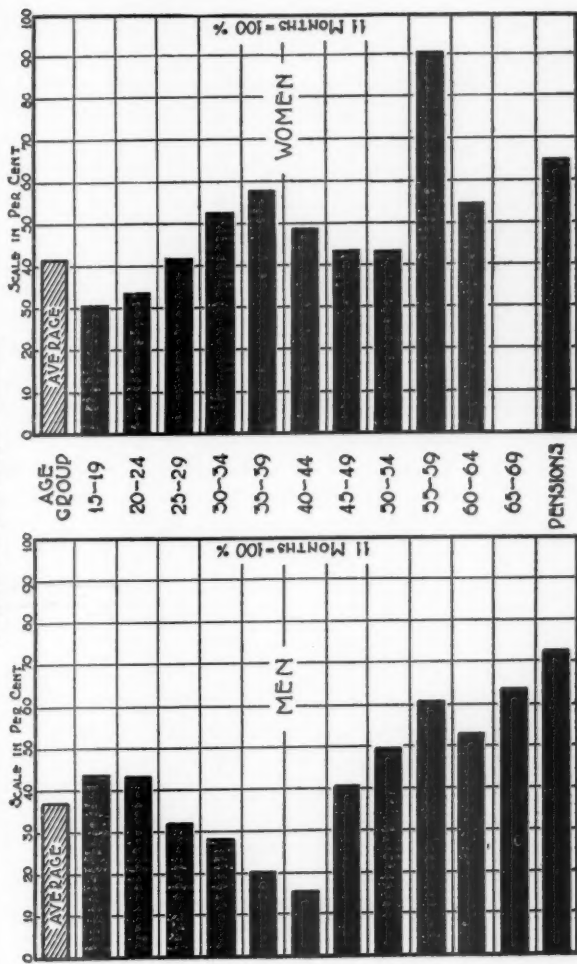
a high or a low figure.[6]  In the second place, sex and age factors were very much mixed on this point.  Despite the greater tenacity displayed by the older workers, age still appears to be a handicap, regardless of sex.  On the other hand, youth reacted quite differently in the two sexes, for the two youngest women's groups established the low record of 3.5 months of lost time, while the young men of the same age averaged about 4.8 months, a figure surpassed only by men over fifty.  Still further, the middle-aged men lost the least time, those 35–44 losing less than 2.0 months, altho women of the corresponding ages were establishing the worst record.  These variations with respect to sex grow partly out of the occupational differences previously cited, and partly out of the industrial structure of New Haven, which is heavily weighted with industries employing women.

The average time lost among Hartford workers was 4.33 months in a total of ten, or about 43 per cent — certainly not far out of line with New Haven results.  Furthermore, the concentration of heavy losses of time in the very old and very young (so characteristic of the men in New Haven) appears again in much milder form in Hartford.  The low record for lost time was established by men 25–34, altho the variation from the overall average was much less pronounced than in New Haven.  Workers over fifty and those under twenty all lost more than half of the possible working time.

The last analysis of the relationship of jobs and time involves merely the count of those workers who were actually holding a permanent job at the time the survey ended.  Knowing that, say, on April 1, 1929, *all* New Haven workers were employed, we can sum up the net

6. Myers (op. cit., p. 479) reports an average loss of time amounting to 5.2 months, but the data are not quite comparable to those given here.

result of the shutdown and the readjustment by finding
out how many were employed on March 1, 1930; or, for
Hartford, September 1 and July 1, respectively. The
results for both cities are shown in the table below.

### TABLE 5

WORKERS EMPLOYED AT CLOSING DATE OF SURVEY

(Number of workers actively seeking work during survey period and
holding jobs at closing date, classified by age groups)

| Age groups | HARTFORD | | NEW HAVEN | | | |
| | | | Men | | Women | |
| | Total number actively seeking work | Number of workers employed July 1, 1930 | Total number actively seeking work | Number of workers employed March 1, 1930 | Total number actively seeking work | Number of workers employed March 1, 1930 |
|---|---|---|---|---|---|---|
| *Total* | *523* | *364* | *227* | *158* | *323* | *247* |
| 15–19 | 9 | 3 | 23 | 13 | 71 | 58 |
| 20–24 | 45 | 30 | 18 | 10 | 67 | 56 |
| 25–29 | 79 | 64 | 26 | 21 | 63 | 51 |
| 30–34 | 91 | 64 | 27 | 23 | 27 | 19 |
| 35–39 | 109 | 81 | 23 | 19 | 33 | 22 |
| 40–44 | 88 | 57 | 32 | 29 | 27 | 19 |
| 45–49 | 50 | 35 | 31 | 21 | 17 | 12 |
| 50–54 | 26 | 18 | 19 | 9 | 10 | 6 |
| 55–59 | 12 | 7 | 14 | 6 | 0 | 0 |
| 60–64 | 8 | 2 | 6 | 3 | 1 | 1 |
| 65–69 | 3 | 2 | 1 | 0 | 0 | 0 |
| Pensions | 3 | 1 | 7 | 4 | 7 | 3 |

In absolute terms approximately 70 per cent of the
men, and 77 per cent of the women in New Haven were
actually working in some job at the end of eleven
months. The distribution by age groups is again sig-
nificant, and it will be noticed that the two youngest
men's groups are again out of line here, averaging only
56 per cent at work as compared to 70 per cent for all
men.

The similarity between the two plants is quite marked. In both New Haven and Hartford practically 70 per cent of the men workers were employed at the close of the study. This represents a somewhat more favorable showing for New Haven, considering the larger proportion of older men in that factory. The best age group in Hartford was 25–29 with a record of 81 per cent employment, as against 74 per cent for those 35–39. There was the same shading off toward the extremes — both the old men and young men fared worse than the middle-aged.

### QUALITY OF NEW JOBS OBTAINED

In analyzing the time element in the unemployment situation we ignored for the moment another dimension of the problem. To appraise the true condition of the unemployed worker we need to know not merely the amount of time lost, but also the quality of the jobs held when work was found. Many factors could conceivably enter into this analysis of quality, but study of this particular situation indicated that psychic and other factors were heavily weighted in favor of the old job with the rubber company; therefore, to make the comparison conservative, these intangibles have been entirely eliminated, and the measurement of quality has been based upon the objective and significant test of *wage rates*. The question has been put in this form: How many workers obtained any *permanent* new job paying wages (*weekly*) at least as high as those paid by the United States Rubber Company?

The answers to this question give a still clearer impression of the setback experienced by the workers in the shutdowns. Thus, only 61 men in New Haven were able to get a job paying as well as the old one, while 130 men failed in this respect. For the women the corre-

sponding figures were 76 and 235, a considerably lower proportion than in the case of the men. Women of, practically all ages fared worse than the men in their new jobs.[7]

### TABLE 6

#### CHANGES IN WAGE RATES

(Number of workers finding work and obtaining any new job paying as high wages as the old one, classified by age groups)

| Age groups | HARTFORD | | NEW HAVEN | | | |
|---|---|---|---|---|---|---|
| | | | Men | | Women | |
| | Total number finding work | Number obtaining any new job paying as high wages as old job | Total number finding work | Number obtaining any new job paying as high wages as old job | Total number finding work | Number obtaining any new job paying as high wages as old job |
| *Total* | *420* | *37* | *191* | *61,* | *311* | *76* |
| 15–19 | 7 | 2 | 22 | 12 | 72 | 32 |
| 20–24 | 35 | 2 | 18 | 9 | 69 | 12 |
| 25–29 | 68 | 5 | 23 | 7 | 59 | 9 |
| 30–34 | 81 | 12 | 27 | 8 | 30 | 10 |
| 35–39 | 88 | 10 | 18 | 3 | 26 | 2 |
| 40–44 | 64 | 3 | 29 | 8 | 25 | 3 |
| 45–49 | 41 | 3 | 24 | 7 | 16 | 4 |
| 50–54 | 20 | 0 | 13 | 3 | 8 | 2 |
| 55–59 | 10 | 0 | 9 | 1 | 1 | 1 |
| 60–64 | 3 | 0 | 3 | 1 | 1 | 1 |
| 65–69 | 2 | 0 | 1 | 0 | 0 | 0 |
| Pensions | 1 | 0 | 4 | 2 | 4 | 0 |

7. Lubin (op. cit., p. 12) reported 46 per cent of the workers earning as much on the new jobs as on the old. Eliminating the cases on which he obtained no information, his men are split almost half and half on the question of earnings.

Myers (op. cit., p. 485) found about 54 per cent of the cutters in jobs paying wages at least equal to the rates on the old jobs.

It is very probable that the business depression partially accounts for this difference, altho this has been allowed for to some extent by the use of full-time earnings in preference to actual earnings on the new job. Even this procedure, however, cannot provide an allowance for the lack of new opportunities available and for the rather unsatisfactory jobs which often had to be accepted by the workers.

Age proves not to be particularly significant on this point, except for the extreme youngsters. The difference (for both sexes) between those under twenty years of age and the rest of the force is very striking. In other words, it was the young apprentices and beginners who bettered themselves. If the gains and losses given in Table 6 were further analyzed to show the number of those getting (or suffering) various percentages of gain (or loss) the results would be even more significant.

The gains turn out to be slight, while the losses are heavy. One third of those reporting a new job paying as well as the old merely succeeded in equaling their former wage rates. The median increase for women falls between 10 and 20 per cent, while for men it is less than 10 per cent. On the other hand, the decreases in wages were not only two times (men) and three times (women) as numerous as the gains, but they were also far more severe. The median losses in wage rates, both for men and women, fall in the class from 30 to 40 per cent, and losses running up to 50 and 60 per cent are not uncommon. Whatever may be thought about the wage scales paid at the Rubber Company plant, they must be rated as very good in comparison with the wages received by the workers on subsequent jobs. Furthermore, these comparisons are for the *best* job ever held in the interval, and *no account whatever is taken of workers who found no jobs at all.*

Hartford results were even worse. Scarcely 9 per cent of the men were able to report any new job paying as well as the old, and half of these got no better than an even break, leaving a mere handful fortunate enough to come out ahead. In Hartford, too, the median decrease was in the class 30 to 40 per cent.

The best method of synthesizing these results is to combine both gains and losses in a general table of

average wages. A multitude of interesting points can
be found in this table, but only a few can be mentioned
here. For one thing, the wage rates of the men averaged
approximately 50 per cent higher than those of the
women, both in the old jobs and in the new. Secondly,
both sexes suffered heavy losses in earning capacity,

TABLE 7

COMPARISON OF WAGE RATES, NEW HAVEN

(Average weekly earnings before and after shutdown, by sex and
age groups)

| Age groups | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Number reporting comparable wage rates | Average weekly earnings | | Number reporting comparable wage rates | Average weekly earnings | |
| | | Rubber Company 1928 | Best-paid job 1929–30 | | Rubber Company 1928 | Best-paid job 1929–30 |
| *Total* ....... | *187* | *31.42* | *25.26* | *306* | *20.65* | *15.68* |
| 15–19....... | 22 | 17.82 | 19.27 | 72 | 17.44 | 15.95 |
| 20–24....... | 18 | 27.08 | 24.97 | 69 | 21.34 | 16.05 |
| 25–29....... | 21 | 34.64 | 29.40 | 59 | 22.08 | 15.83 |
| 30–34....... | 27 | 34.24 | 27.17 | 29 | 21.26 | 17.33 |
| 35–39.... . | 18 | 33.92 | 25.97 | 25 | 23.94 | 13.88 |
| 40–44....... | 29 | 33.78 | 27.05 | 23 | 22.32 | 15.70 |
| 45–49....... | 23 | 32.86 | 25.47 | 16 | 20.38 | 13.38 |
| 50–54....... | 13 | 33.58 | 24.50 | 8 | 17.31 | 14.19 |
| 55–59....... | 9 | 36.78 | 22.89 | 1 | 10.50 | 14.00 |
| 60–64....... | 3 | 29.33 | 24.67 | 0 | .... | .... |
| Pensions .... | 4 | 28.50 | 15.63 | 4 | 21.00 | 14.13 |

the men's wages slightly exceeding 80 per cent of the
old rates, while the women barely attained 76 per cent.
Generally speaking, throughout all age groups, the
women came off second-best to the men in the new jobs.
Thirdly, youth made out much better than age. For
the men there is almost a steady decline in the relative
percentages from youth to age; men under twenty were
the only age group to make a real gain in wages. The

same tendencies are observable, though less clearly defined, in the women's percentages. Fourthly, the occupational status of certain workers, previously noted, comes to light in these figures. The women, 35–39, who as shoemakers made the highest wages in the plant among their sex, made the poorest readjustment and

TABLE 8

COMPARISON OF WAGE RATES, HARTFORD

(Average weekly earnings before and after shutdown, by age groups)

| Age groups | Number reporting comparable wage rates | Average weekly earnings | |
|---|---|---|---|
| | | Rubber Company Jan.–Aug. 1929 | Best-paid job 1929–30 |
| *Total* ........ | *405* | *37.15* | *26.16* |
| 15–19........ | 7 | 28.71 | 22.14 |
| 20–24........ | 33 | 32.80 | 24.24 |
| 25–29........ | 68 | 35.52 | 25.16 |
| 30–34........ | 81 | 37.72 | 26.99 |
| 35–39........ | 81 | 38.41 | 26.95 |
| 40–44........ | 62 | 39.35 | 26.90 |
| 45–49........ | 40 | 38.88 | 28.14 |
| 50–54........ | 19 | 36.55 | 22.87 |
| 55–59........ | 9 | 32.61 | 23.00 |
| 60–64........ | 3 | 38.17 | 27.00 |
| 65–69........ | 1 | 34.00 | 25.00 |
| Pensions ..... | 1 | 49.50 | 15.00 |

came out with practically the lowest wages. Likewise, the good records made by those under twenty of both sexes can be partly attributed to their beginning or apprenticeship status with its consequent low wages.

In the Hartford data the most significant facts are: (1) the greater decline in wage rates as compared with New Haven, and (2) the marked similarity of this decline in practically all age groups; a very slight downward trend from youth to age can be discerned, but it

is unimportant. The severe decline in wages among the Hartford workers — to 70 per cent as against 80 per cent for men in New Haven — is not due to the poor quality of the new jobs (which will be seen to average higher in absolute wage rates than did those in New Haven) but to the higher wage level existing in the Hartford factory. All the middle-aged groups there were averaging $38–39 per week, and even the youngest, lowest-paid group was just under $29. In other words, the fall was greater because the peak had been higher.

## Annual Income

The final estimate of the displaced worker's change in well-being depends not alone upon time lost or wage rates obtained, but upon the combination of these two, i. e. upon income received. In view of the more nearly complete coverage of the entire working force obtained in the New Haven survey, and also of the better quality of data collected there, a special computation on annual income has been made for the workers in that plant. Such a comparison should put the finishing touches on the appraisal of the shutdown's effects.

The total annual earnings of the individual workers at the rubber shop were collected from the 1928 income tax cards. This was the last full year the plant operated prior to the shutdown, and it was a normal year in most respects. Against these figures for each individual worker has been set up the estimated total earnings for the period April 1, 1929, to April 1, 1930 — one full year following the shutdown. These estimates have been based upon the length of time worked on each job and the corresponding wage rates reported for each worker. Space forbids a complete discussion of the detailed methods used in making such estimates. No

attempt has been made to use the data for each individual in any way, but, combined by age and sex groups, the group totals have been directly compared: 1928 earnings with the Rubber Company versus 1929–30 earnings for one year following the shutdown. Those who actively sought work (even tho they never found it) have been included with zero or temporary-job earnings for the second year; those not looking for a job have been excluded, as have pensioners and certain other incomparables.

The data speak for themselves, but of course too much cannot be claimed for them. They do show that in New Haven in 1929–30 a particular group of displaced workers suffered net losses in annual earnings of approximately 50 per cent. What this means to the workers in reduced standards of living and to the business community in loss of purchasing power can better be imagined than expressed. In case raw figures seem to express it more effectively than percentages, an additional fact can be added: *for those workers included in the comparison* the total 1928 earnings slightly exceeded $500,000; the post-shutdown earnings of the same group were about $264,000.

A brief comment on the sex factor is necessary. The women's over-all average is thoroly representative both because all age groups fared very much alike, and also because women over fifty were not numerous. The men's average, however, is unduly depressed by the disastrous decline in the earnings of the older men. If a mild allowance is made for the disproportionate weight of the older groups, it is safe to say that the men would average well above 55 per cent.

Acknowledging the possibility of a considerable margin of error in practically all the foregoing figures, and making a rough summary only, we can say in conclusion

CHART III

ANNUAL EARNINGS OF NEW HAVEN WORKERS, 1929-30

(Expressed in percentage of 1928 annual earnings)
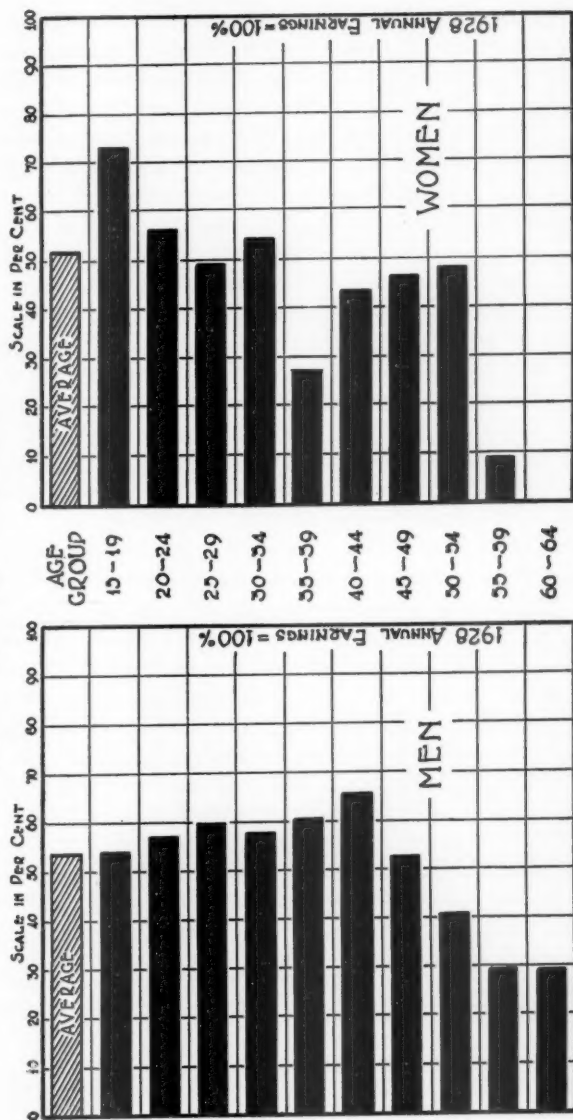
that in New Haven the typical male worker in the course of one year immediately following the shutdown suffered a loss of 37 per cent in working time, an additional loss of 20 per cent in wage rates, making a total decline of about 45 per cent in annual earnings; the typical female worker lost 40 per cent of working time, 24 per cent in wage rates, making a total loss of about 50 per cent in annual earnings.

## The Dismissal Wage

Of the 729 Candee [8] workers included in this survey, 97 received a dismissal wage, the payments ranging from a minimum of $137 to a maximum of $2,088; the median payment was about $425.   Since the wage paid was equal to one week's pay for each year of service, the amount depended both upon current earnings and length of time worked for the company.

The philosophy of the dismissal wage policy was a rather complex one.   In the first place, the payment was regarded as the recognition of a moral responsibility of the company to its long-service workers.   Three groups in particular were believed to be entitled to special consideration: (1) workers who stayed with the company during the war, refusing opportunities to obtain higher wages in other industries; (2) workers whose age would be a handicap to them in seeking further employment; and (3) workers, not yet old perhaps, who had never worked in any other factory and who had entirely lost the knack of getting a job.[9]   The terms of the dismissal wage payments were adapted to cover these points.   In the second place, there was a practical purpose involved

8. Similar data on dismissal wages in Hartford have been omitted for lack of space.

9. See E. H. Little, The United States Rubber Company's Use of a Dismissal Wage (American Management Association, Personnel Series No. 6, 1930).

in the payments. The dismissal wages were paid as part of a contract by which the worker agreed to stay on the job from the time the announcement of the closing was made until the plant actually shut down — a matter of three or four weeks. The object achieved by this means was the maintenance of morale in the closing weeks of the shutdown. The fact that damage loss was reduced and standard of workmanship actually improved in the New Haven factory *after* the shutdown was announced is cited by the Company as evidence that the wage payments were effective in fulfilling this purpose.

The interest in these dismissal wage payments lies not so much in the purposes or philosophy of the company in paying them as in their results so far as the workers are concerned. Did these payments facilitate the readjustment of the workers, or were they in effect a mere form of relief which did little more than postpone the eventual disaster?

No less than 90 of the 97 workers (excluding foremen) receiving a dismissal wage in New Haven were found and interviewed in the course of the survey. For the most part these workers were amicably disposed toward the company and the investigators and talked very freely of their problems.

Without going into tabular details we here present the more obvious generalizations which can safely be applied to these workers. In the first place, contrary perhaps to popular expectation, they proved just as aggressive in looking for work as did any of their fellows. Some of them, it is true, did use the wage as a means of retiring from active work (this was true of a few of the women), but these were the very old workers who would probably have retired soon in any case. The rest went out looking for work the day after the plant

was closed and, what is even more interesting, they succeeded in finding it. A direct comparison between the dismissal wage workers and the other workers in each age group shows that the dismissal wage men and women found their jobs just as quickly as the others; in fact they even had a slight advantage, so far as the figures go.[1] There is, then, no gound for thinking that the dismissal wage operated in any way as a drag on the worker's initiative.

Another point worth noting is that those who used the dismissal wage payment to go into business for themselves were generally unsuccessful. There were less than a dozen who tried any sort of independent venture, but of those who did so the great majority failed — if not technically, at least for all practical purposes. The men putting their money into grocery stores, pool rooms, shoe repairing, and the like, or the women buying into partnership in restaurants, starting a rooming-house, etc. — practically all these were venturing into fields of activity for which they had no particular training and no special aptitude. And of course they started their business activities in a period of depression when conditions could hardly have been more inauspicious. There were only one or two outstanding cases of success. One of these was a shoemaker who set up a shoe-repairing establishment in a fine residential neighborhood, where by doing work of a very high quality he succeeded in capturing the market and is now making far more money than he ever did at the plant.[2]

Most of the workers found it necessary to use their money for current living expenses. Out of 90 workers

1. The results obtained on this point check very closely with those of Myers. Cf. R. J. Myers, as cited.
2. For further detail on some of these workers, see "When Shutdown Came" in Survey Graphic, February, 1931.

receiving these wage payments only 26 reported having any of the money on hand at the end of a year. Making a rough estimate based on the facts reported by the workers, we conclude that in absolute amounts about one fifth of the total dismissal wage payments made to this group of workers was still available in liquid form at the end of a year. In any case, it seems that the bulk of it had been spent by that time. Thus the money was used to tide the workers over the period of adjustment.

With a view to determining the adequacy of these payments for such a purpose, the following table has been constructed. The question has been phrased as follows: To what extent did the dismissal wage payments cover the losses in earning power in the year following the shutdown? It has been fully brought out in the preceding sections of this paper that practically all classes of workers suffered heavy reductions in earnings after the shutdown. Those receiving dismissal wages suffered more than the average, largely because they were in the older age groups. The problem is whether the dismissal wages were adequate to carry them at their previous standard of living for a period of one year, by supplementing their earnings in their new jobs.

The extremely heavy losses in earning power of both men and women is shown in the table. Thus 1929–30 earnings for the men barely exceeded 40 per cent of 1928 while for women the proportion was only 36 per cent. Adding to these 1929–30 earnings the total amount of dismissal wages received by these same workers has the effect of cutting the losses very considerably but leaves them still significant. The essential similarity in the percentages for men and women (84 *versus* 82) indicates that it was not a matter of sex. For the most part, also, the final result is quite independent of age, due to the

fact that, altho earnings were lower for the oldest
workers, at the same time the dismissal wage payments
were higher because of long service. However, because
of the small numbers involved, the data for particular
age groups are generally erratic.

TABLE 9

ANNUAL EARNINGS, DISMISSAL WAGE WORKERS, NEW HAVEN

(Showing percentage comparisons with 1928 earnings of (1) 1929–30
earnings, and (2) 1929–30 earnings plus dismissal wage payments; by
sex and age groups)

| Age groups | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Number of workers reporting comparable data | 1929–30 earnings (1928 = 100 %) | 1929–30 earnings plus dismissal wage payment (1928 = 100 %) | Number of workers reporting comparable data | 1929–30 earnings (1928 = 100 %) | 1929–30 earnings plus dismissal-wage payment (1928 = 100 %) |
| *Total* ....... | *53* | *40.2* | *83.9* | *20* | *36.3* | *82.0* |
| 30–34........ | 1 | 16.0 | 54.3 | 1 | 14.5 | 36.5 |
| 35–39........ | 3 | 48.3 | 83.5 | 2 | 31.5 | 73.3 |
| 40–44........ | 4 | 73.0 | 113.3 | 4 | 54.9 | 102.4 |
| 45–49........ | 16 | 42.3 | 79.6 | 8 | 25.8 | 66.1 |
| 50–54........ | 16 | 29.3 | 68.9 | 4 | 53.0 | 122.4 |
| 55–59........ | 11 | 32.5 | 94.4 | 1 | 9.5 | 40.7 |
| 60–64........ | 2 | 76.2 | 136.7 | 0 | .... | .... |

The conclusion on this point must be that the dis-
missal wage was not quite adequate to cover the lost
earnings of the displaced workers over a period of one
year. It seems clear, however, that by providing cur-
rent spending money it was a vital factor in facilitating
the readjustment.

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# REVIEW

## FLORENCE'S STATISTICAL METHOD
## IN ECONOMICS AND POLITICAL SCIENCE [1]

THE development of quantitative methods in the social sciences is a most impressive phenomenon. The trees are growing so luxuriantly and so close to us that it is hard to see what is happening to the forest. Appraisal of the net results presents a standing challenge to theorists, for the hoary problems of general scientific methodology are always intriguing, accretions of new facts seem to need synthesis, and variations in temperament help to produce differences in interpretation.

Professor Florence's essay contains much that is familiar to scholars, as befits an extended systematic methodological treatise. His previous publications on industrial fatigue, population, and social science procedure are of course freely drawn upon. The present work, however, elaborates as well as correlates these earlier writings; it introduces a wealth of illustrations; and it tackles the unusual problem of a statistical politics. The following passages will serve as a summary of the major portion of the book, and as a sample of the author's felicitous style:

The statistical approach in economics set forth in Chapters XV to XVIII made use of the orthodox system of economic theory as an iron framework on which to build. In political science, on the other hand, there is no such theoretical framework that can be usefully employed. Ethical and moral implications have not yet been exorcised and there is little trace of the notion of flexible and variable characters and conditions such as economic theory now admits. Hence, in Chapter XIX I have been compelled to build my own

1. The Statistical Method in Economics and Political Science; a treatise on the quantitative and institutional approach to social and industrial problems, by P. Sargant Florence. New York, 1929: Harcourt, Brace & Co. Pp. 521.

framework and apparatus of thought. No specific theories or laws were put forward, but an attempt was made so to select and define terms, and so to orientate the investigator that the field would be prepared for statistical measurement . . .

The *new* political science embodying these generalizations is *indicative*, not optative or ethical in mood; *inductive*, starting with observation of item facts, not deductive and speculative; *realistic* and observant of actual practice and customs instead of legal fictions; *comparative* rather than snobbish or impressionistic in observing all possible cases of similar practice among all sorts of groups and organizations besides the State; and finally, the new political science attempts to use numerical measurement and to be statistical, not in the original sense of STATE-istical, compiling isolated facts about the State, but in the new sense of summarizing variations and interrelations numerically . . . (p. 429).

Some authorities have said that the quantitative theorist does not so much prove or disprove the older qualitative theories, as lose interest in them. Professor Florence's position, for all his disposition to hunt with the heretical hounds, is very different. He uses the Marshallian principles as a framework, defends them on many occasions, and is interested in all the "twelve" old laws (p. 292n.), — which he says are essentially concepts or assertions of co-variation (correlation) between sets of phenomena such as quantity exchanged and price. These laws, he holds, are nearly all restricted to *rates* of exchange; they "do not seek to explain either variations in price over different times and places or variations in the *amounts* exchanged, with the one exception of the law of comparative costs in international trade." And all are static: the law of population, for example, assumes that technological factors do not change. He is chary of proposing or prophesying new laws, but we may infer that attention to total quantities and to time and place trends will continuously produce new laws that are more dynamic (i.e. more realistic, less abstract). Does not Marshall's notion of increasing return contain a trend-prophecy in regard to productive methods? "Substantive inventions" are abstracted, but minor improvements of technique are expected to be a result, as well as a cause, of increased output of an industry as well as of an establishment.

The "fieldwork" involved in securing new statistical materials is properly and rather novelly emphasized, as a ground which theorists and statisticians need to cross-cultivate more thoroly. In this manner schedules, definitions, editing, and the like, may extract the utmost information of scientific significance from available sources of data. Useful hints are given as to quantitative indexes for old "boxes," like industrial revolution and division of labor; and some new boxes are made and stocked.

Our author's emphasis on the limits of statistical proof and the need of non-statistical types of evidence and interpretation is very wholesome, yet I think bolder claims for quantitative methods might well be made. When critics object that "statistical demand curves" are not the theorist's demand curves, for example, the suggestion is often conveyed that measurement must be all or none; that an entity can be measured either perfectly or in no degree. But surely any measurement is imperfect, in the view of omniscience; surely measurement always begins with crude indices like offhand human judgments of temperature, and progresses through increasingly comprehensive and accurate scales. It is salutary to emphasize the limitations of crude indices; but let us also make clear that initial measurements are always likely to be crude. A counter-offensive might also be developed against the gibe that "mere correlation" tells us nothing about "causation," it seems to me, out of the classical skeptic metaphysics represented by Hume.

Such notions as these, with illustrative quantitative data, are applied to a wide range of theoretical matters, including the institutional and psychological fringes of economics. The chapters on government, for instance, analyze and weigh many economic influences operating on and from that "institution." In his studies of fatigue, Professor Florence had learned that psycho-physiological science offers much to the economist in the way of hypotheses and something in the way of statistical data. In the present volume he proceeds further to deal with other psycho-economic matters, such as work, saving, risk-taking, and anticipation. He shows how the doc-

trine of probability may explode a Freudian fallacy of coincidence, and argues that no general scheme of psychology — hedonist, instinct, or whatnot — can serve as the basis for much purely deductive construction of economic theory that is really useful. His psychological remarks are by no means exhaustive; he hardly raises the question, for instance, of how to define economic welfare. But generally his psychologizing seems judicious and progressive.

In this connection and many others he reproaches orthodox economists for their "excogitary or speculative method." I believe this stricture is partly founded on a confusion of the scientific with the pedagogical problems of economists. The textbook sections which he and others censure in this vein are perhaps not usually intended by their writers to tell the whole truth, and still less to show how the part-truths which they express were discovered. They are designed primarily to initiate outsiders into the general notions of our science as promptly as may be. Nevertheless the current tendency which Professor Florence aids and abets, to inject samples of economic data and research methods into our texts, and to overhaul the methodological pronouncements accordingly, is thoroly salutary.

Considerable space is occupied in this book by elementary exposition of statistical terms and methods, for the benefit of readers who have had no previous familiarity with them. This latter class is supposed to include most British economists, and presumably the bulk of political scientists everywhere. Practically no attempt is made to deal with advanced statistical or mathematical economics. "As a substitute for the laboratory," the author remarks elsewhere, "recourse must be had to statistical methods. This does not mean more mathematics unintelligible to the average reader, but rather the displacing of pure mathematics of the differential calculus type by mathematics which the professional mathematician considers so easy as hardly to deserve the name." Many persons, who do not need his primer and glossary to teach them the meanings of simple averages and trends, conclude without much ado that his book is not for them. But the

methodological discussions of quantitative economics, which have become almost perennial at our annual Association meetings, seem to show that our theoretical right hands (crammed with old dialectical literature) still know none too well the significance of what our statistical left hands are doing, *and vice versa*. Professor Florence has given us an exposition of the fundamental relations between them which is remarkable in breadth, insight, and lucidity.

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# NOTES

## STOCK DIVIDENDS IN LARGE AND
## SMALL COMPANIES

THE recent merger movement in the industry of the United States has brought into the clearest light the influence which promoting and financial interests may exert upon the structure of business, and tends to confirm the view that such interests may operate to bring into existence many concerns which in size and constitution are too unwieldy to be efficient.[1] It is not so commonly appreciated that a period of general prosperity is likely to bring over-expansion in another way: that is, through the internal pressure created within concerns which are making large profits and are accumulating instead of distributing them to shareholders. In the past fifteen or twenty years corporate savings have undoubtedly become a more important part of national savings, until now it appears to be the normal thing for a concern to retain a large part of its net annual income and utilize it for expansion in one form or another. In manufacturing as a whole in the United States in 1925 corporate savings appeared to have been about one third of net profits available for disbursement.[2] A report of the Federal Trade Commission,[3] admittedly dealing with a biased sample of corporations,[4] shows how small a proportion of their surplus was distributed in the form of cash dividends in the period 1920–26.

1. See Veblen, Theory of Business Enterprise, p. 35; and addresses by W. L. Thorp before the American Paint and Varnish Manufactures Association, October 15, 1929, and the Motor Association, September, 1929.
2. Copeland, Recent Economic Changes, p. 790.
3. Stock Dividends, pp. 11–13.
4. The bias derives from the fact that the Commission, in its investigation, was interested only in concerns which had declared stock dividends, 1913–27. The overwhelming majority of these firms had declared such dividends between 1920 and 1927, and it would seem, therefore, that they were, on the whole, more prosperous than the average.

## TABLE I

PERCENTAGE DISPOSITION OF APPROXIMATE TOTAL DISTRIBUTABLE
SURPLUS [5] FOR CORPORATIONS PAYING STOCK
DIVIDENDS, 1920–27 [6]

|  | Sample of 2,971 corporations | Sample of 566 corporations |
|---|---|---|
| Total surplus available for distribution | 100.0 | 100.0 |
| Cash dividends .................... | 34.2 | 35.0 |
| Stock dividends.................... | 27.8 | 24.8 |
| Other dividends.................... | 0.2 | 0.1 |
| Undistributed...................... | 37.8 | 40.1 |

It appears that, for the corporation of this type, it is usual to retain about two thirds of the net income, to be used either for outside investment in other concerns or for its own vertical or horizontal growth.[7]

One interesting question immediately presents itself. There have been suggestions that the largest concerns in many industries are not the most efficient when measured by unit costs or profits on investment, and that there is a strong tendency for business units to grow beyond the optimum size. May the internal pressure of corporate savings among very large firms not account for this? To raise capital in this way is the cheapest method of collection. In a dynamic industrial society there is a marked inclination to look forward to a widening market. And a large corporation, so long as it can persuade the shareholders, either by reason or bluff, that it is worth while sacrificing present income in the anticipation of future profits, may continue to expand by this means even when conditions do not justify it. As a concern grows, there will come a point at which increased size will bring decreasing efficiency, yet it is quite possible that the habit of corporate

5. The Commission gives no definition of 'surplus' but presumably it is net profits after the deduction of interest on bonds and mortgages.

6. The sample of 566 corporations appears to be rather less biased than that for the 2,971 concerns, but the closeness of the agreement between the two suggests that for this class of corporation — i. e., that which issued stock dividends 1913–26 — the result will be fairly true for industry as a whole.

7. See W. L. Thorp, Recent Economic Changes, p. 188 et seq., and L. Kotany, Quarterly Journal of Economics, vol. xxxvi, p. 416 et seq.

saving will persist so strongly, or the temptation to associate indefinite growth with efficiency continue so long, that the large concern will be pushed on to dimensions from which it would retreat but for the presence of the overhead costs it must now meet. One is led to ask whether it is the largest firms that indulge in this practice of corporate saving. How do large and small firms compare in the proportion of their net income which they force the shareholder, involuntarily, to put on one side for the increase of physical assets?

Some of the largest concerns which have operated in the United States, and among them some which have been most strongly suspected of the weakness of excessive size, have grown largely from their own savings. Up to 1919 the Meat Packing Trust left about 68 per cent of its earnings in the business.[8] Nearly 90 per cent of the increased investment which the United States Steel Corporation put into its concerns between 1901 and 1910 came from savings.[9] The railways in the United States increased their investment in roads and equipment by $4,605,000,000 between 1920 and 1927 but only increased their capitalization (stocks and funded debt) by $1,143,000,000, showing that the great bulk of improvements and extensions came from profits.[1] But no generalization upon isolated examples of this sort would be safe.

The manner in which the Federal Trade Commission has presented its material in the report mentioned makes it impossible to determine what proportions of their net incomes were saved by firms of varying size. But this saving takes different forms and one of these can be roughly measured. A concern which is accumulating profits may merely utilize its income to increase its material assets without any change in its outstanding capital stock. But another common form by which saving is shown is to issue stock dividends, and Table I above suggests that between 1920 and 1927 such dividends represented nearly one half of the total corporate savings. The

8. Federal Trade Commission, Report on the Meat Packing Industry, 1919, Part V, p. 18.
9. Bureau of Corporations, Report on the Steel Industry, Part I, p. 49.
1. W. J. Cunningham, Recent Economic Changes, p. 265.

extent to which different size groups increased their capital
stock, and the degree to which such increases could be ac-
counted for by issues of stock dividends between 1920 and
1927 are shown in Table II:

### TABLE II

INCREASE IN CAPITAL STOCK, AND STOCK DIVIDENDS REPORTED
BY 1,000 COMPANIES IN SIZE GROUPS,[1] 1920–26

| Size group by capital stock in 1920 (dollars) | Number of corporations | Total capital stock (millions of dollars) | | Total stock dividends reported (millions of dollars) | Percentage increase of capital stock, 1920–26 | Percentage of stock dividends to increase in cap'l stock |
| --- | --- | --- | --- | --- | --- | --- |
| | | 1920 | 1926 | | | |
| 0– 40,000 | 358 | 5.0 | 35.7 | 21.9 | 614 | 71 |
| 40– 80,000 | 157 | 8.8 | 31.2 | 16.0 | 255 | 71 |
| 80–150,000 | 113 | 12.7 | 39.4 | 20.8 | 210 | 78 |
| 150–300,000 | 90 | 18.7 | 60.1 | 33.2 | 222 | 80 |
| 300–600,000 | 76 | 32.8 | 78.9 | 31.8 | 141 | 69 |
| 600,000–1,000,000 | 50 | 39.2 | 99.3 | 50.2 | 153 | 84 |
| 1–5,000,000 | 56 | 127.2 | 336.7 | 83.5 | 165 | 40 |
| 5–10,000,000 | 50 | 334.6 | 579.2 | 194.3 | 73 | 79 |
| Over 10,000,000 | 50 | 1473.4 | 2310.6 | 698.1 | 57 | 83 |

[1] It is important to exercise the greatest caution in interpreting this table for reasons
connected with the nature of the material and the methods employed:

(a) The sample is one of 1,000 corporations taken from a list of some 10,000 corpora-
tions which had paid stock dividends at some time between January 1, 1920, and De-
cember 31, 1926. The sample was drawn in the following manner. All the corporations
whose titles began with the letter A or the letter N were first taken. This still left the
sixth, eighth and ninth size groups small. The number of corporations in these groups
was then increased to what was considered a satisfactory size by running through an
alphabetical list of all the corporations.

(b) In some cases the Commission was unable to obtain details, for January 1, 1920,
or December 31, 1926. In all such cases figures for the nearest dates were taken. This
ought not to affect the comparison between different groups if each is biased to the same
degree.

(c) The stock dividends reported are not a complete record of all such dividends paid
in the period. It is impossible to determine to what extent omissions have occurred, but
there are two reasons why they should not invalidate the comparison between the dif-
ferent groups. In the first place all groups will have been affected to some degree by this
factor. And, in the second, whilst the proportion which stock dividends issued bore to
the increase in stock capitalization between 1920–27 for 2,846 corporations, for which full
information was available, was 76 per cent, the corresponding figure for the sample in
Table II was 71 per cent.

(d) The period 1920–26 brought an abnormal issue of stock dividends. The great
prosperity in American industry at that time undoubtedly produced conditions which
made such an issue possible. But before 1920 it was uncertain whether stock dividends
were taxable or not and there had been extremely heavy reinvestment by corporations
which was, in consequence, not capitalized until after the decision in Eisner *v.* Ma-
comber. This raises the question whether, in order to group the corporations by size it
might not have been preferable to take stock capitalization in 1927 rather than 1920,
since many firms which appeared to be small, in stock capital, in 1920 might have been
so only because of this reluctance to capitalize their increase in material assets. On the
whole, however, it seemed preferable to group by 1920 capitalization.

(e) The whole of the argument based upon Table II implies a simplified process by

The incompleteness of the material used; the presence of a bias in the sample; the fact that the issue of stock dividends may only represent a part of corporate savings which may vary in importance from one size group to another; the possibility of the manipulation of stock capital without any real change in the resources placed at the disposal of the corporation — all these make it unsafe to generalize upon the trends revealed in this table. A more exhaustive analysis by the Commission, with information which presumably they must have had on hand for the preparation of the report on stock dividends, would be vital in a study of the forces operating in business growth. Meanwhile the sample appears to point to the following conclusions:

1. As was to be expected, the rate of growth, when measured by stock capitalization, is greater for the small groups and tends to decline in the larger. Corporations can, of course, raise capital through bond issues, mortgages or similar devices. And it may well be that such methods are proportionately more important in some size groups than others, particularly in a period of exceptional expansion such as 1920–27. Nevertheless the suggestion is strong that increased size brings increased resistance to further growth.

2. Even up to the very largest group, the tendency is strongly marked for the issue of stock dividends to account for the greater proportion of the increase in stock capitalization. Altho the largest concerns grow less than the smaller, they are equally inclined to use accumulated profits to provide the means for expansion. It seems a fair inference, therefore, that we have here an influence making for excessive size and for

which increases in stock capitalization represent increased resources placed at the disposal of the corporation and stock dividends constitute one part of these resources. But stock dividends might merely represent a process of ' watering ' capital and not real savings. Or the corporation, even whilst declaring such dividends, might transfer the rights of some stock holders into the form of bonds, in which case the stock capitalisation would not measure the true increase in the material assets of the corporation. Or a concern, after a period of prosperity, and the declaration of stock dividends which were real savings, might strike a period of depression and write down its stock in conformity with the reduction in its earning power. In such a case stock dividends would have an exaggerated importance in relation to the increase in stock capitalisation. For example some of the corporations included in the table show an issue of stock dividends between 1920 and 1927 which was greater than the actual increase in outstanding stock capitalisation. These are probably to be explained by one or other of the above causes. But perhaps these abnormal examples are not more important in one size group than another.

(*f*) For other minor points see the Commission report, p. 47.

the ultimate inefficiency of the large concern. So long as the practice of corporate saving remains as automatic an operation as it now appears to be, there must be an overpowering temptation among the largest concerns to move on to dimensions which have little to justify them on the score of efficiency in the immediate future.

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## INTERNATIONAL CONTROL OF PRICE LEVELS

PRIOR to the Great War the typical European central bank was charged with only a few, altho highly important, responsibilities, the principal one of which was to maintain the currency of its country upon a solid foundation of gold. It is true that in the formulation of its policies the banking administration was not inattentive to a number of other considerations, such as the state of money market, the movement of foreign exchange rates, conditions in the investment and speculative markets, and the prevailing spirit of business enterprise. But these latter considerations were regarded as more or less subsidiary to the main obligation and were analyzed principally from the standpoint of the preliminary evidence they would afford of forthcoming difficulties in maintaining the gold redeemability of the country's paper money and bank credit.

In late years, however, it seems to have become not altogether unorthodox to hold central banks responsible for accomplishing certain broad economic ends, with emphasis upon the stabilization of the general price level. In Cassel's economic system the prime obligation of any central bank is to maintain unchanged the purchasing power of the country's monetary unit. Keynes has insisted that, even for Great Britain, a nation whose prosperity depends so largely upon foreign trade, internal price stability is of far greater importance than the avoidance of exchange fluctuations be-

tween the pound and the moneys of foreign countries. In the United States the several drafts of the Strong bill attest to the strength of the opinion that the movement of commodity prices should be one of the principal concerns of the Reserve Banks.

It is not at all difficult to account for the persistence of the price stability program in the preachments of economists and men of finance to central banks. Inter-country obligations inherited from the War are so vast that changes in the purchasing power of gold seem to be equivalent to the modification of international contracts to the advantage of one side or the other. Then again the continued investigation of business cycle problems has suggested to a constantly broadening circle the interrelationships of prices and the course of business activity. Of more importance possibly than either of the above influences is the fact that the country in which inductive researches of economic cycles have received the most elaborate attention — the United States — now has a central banking system. The area subserved by the Federal Reserve System is so great that domestic policies might operate with far wider scope before obstructed by international correctives. Then again, largely as a consequence of unpredictable war events, the Reserve System has usually possessed abundant surplus reserves. It has been in a position to formulate its policies with regard to a broad variety of economic and financial considerations.

In interpreting the course of commodity prices under the Federal Reserve, the proponents of price stabilization via central banking action seem, however, to have been confronted with a multitude of perplexing policy problems. There is no doubt but that many of the most zealous stabilizationists have at times been highly chagrined because of the irresponsiveness of prices to credit conditions. To hold the Reserve Banks culpable for what has occurred might therefore serve only to engender in the mind of the public doubt regarding the power of any central bank to control price levels. For, to select a few illustrations, the price recessions of 1924 and of 1927–28 occurred at times when the Reserve Banks

were making vigorous efforts to ease the money market. On the other hand, the sharp, tho brief, commodity price advance of 1928 took place at a time in which the Reserve Banks were operating to induce restraint in the market's use of credit. Neither has it been easy to fasten responsibility upon the falling rate of the world's gold production. For, despite the justification of grave anxieties for the future, there certainly has not as yet been any real gold shortage. Several of the central banks, particularly in the United States and France, undeniably possess large surplus gold reserves.

To engender confidence in the position that price levels could be controlled by credit policies it has apparently seemed advisable, particularly to many of the foreign stabilizationists, to place the blame upon certain maladjustments in the distribution of the world's gold, which, since they seem to be beyond the control of individually operating central banks, require for effective regulation, international financial cooperation. Thus the Reserve Banks are no longer held guilty on the charge of sterilizing purposely the huge gold imports of 1924. It is now generally agreed that the Reserve Banks in that year could not without sacrificing principles have prevented member banks from utilizing such a large portion of the imported gold to discharge their debts to reserve institutions instead of employing it as a basis for further credit expansion. It is likewise coming to be admitted that the Reserve Banks' efforts in 1928–29 to curb the stock market's utilization of foreign as well as of domestic funds were defeated largely because of the rise of money rates to a point attracting gold from all parts of the world, thereby producing, so it is contended, the present decline in international prices. In similar fashion recent French imports of gold are not laid, by the more astute price stabilizationists, at the door of selfish policy by the Bank of France. To obtain needed cash for internal purposes, French joint stock banks are simply selling out their holdings abroad and converting them into gold. It is admitted that charter restrictions prevent the Bank of France from operating effectively to restrain the inflow by purchasing this foreign exchange and issuing to domestic

banks in payment therefor notes adapted to general circulation.

But, in acquitting the various central banks, under present conditions of operation, of responsibility for recent price movements, it is insisted by the stabilizationist that international controls must now be set up and developed. It is suggested that in France the Bank for International Settlements could, in conjunction with the French central bank, do the things which the restrictions of its charter now prevent the Bank of France from accomplishing. Elsewhere, as is indicated in the Interim Report of the Gold Delegation of the League of Nations (Geneva, 1930), it is contended that concerted action should be attempted in various countries to economize gold so as to avoid the strains created by the maldistributions of the world's monetary stock. For one matter, metallic subsidiary currency, not requiring a gold cover, might be substituted in larger degree for note currency. For another matter, the extension of the checking system should permit a substantial amount of gold secured currency to be withdrawn from general circulation. Finally, the stabilizationist holds that there must be less public opposition to the efforts of central banks to base their activities upon international considerations and less political objection in various countries to the extension by the central banks, in time of need, of credits for the account of foreign institutions.

With suggestions of this sort the writer has a large degree of sympathy. The present dissatisfaction with the existing organization merely brings out what every pre-war central banking administration firmly realized in its emphasis upon gold movements, that currency and credit expansion at home must not exceed the international standard. In the United States we are having daily borne in on us the importance of international economic forces. We have long since learned, for instance, that a pronounced inflow of gold from abroad is more likely to be accompanied by falling than by rising prices. Prices of imported commodities are fixed very largely by world conditions, and liquidating tendencies abroad cannot always be offset by easy credit at home.

When it comes, however, to the employment of powerful international devices to control price levels it is all the more necessary to insist on the most meticulous diagnoses of price level displacements. Mistakes will then apply to a broader field, and may serve to generate evils of more than the traditional magnitude. As long as credit policy at home was limited in the scope of its efficacy by counteracting tendencies abroad it did not make so much difference whether we had correct insight into the causes of price level displacements. But when it is suggested that we expand the scope of international financial consortiums and widen the powers of the Bank for International Settlements we simply cannot afford to base policies upon inaccurate analyses.

The danger that more effective provision for international coöperation will not be matched by superior intellectual insight into economic causation seems to the writer to be exemplified by the over-mechanical approach to the price problem which almost daily characterizes the thinking of the price stabilizationists. Despite occasional concessions and qualifications it is assumed more or less as a matter of course that the desirable price level always is that one which does not move upward or downward from a previous point, that there can be no credit inflation unless price averages rise, as well as no deflation unless price levels fall. In terms of the present situation it is scarcely ever admitted that prices which move downward may be inflated just as much as prices which move upward, in that they may have too much credit in them. It is not often granted that it is within the realm of possibilities at least that for a considerable period of time a healthier price situation might be one in which prices are permitted to report altered conditions relative to the supply of climatically determined raw materials, to the utilization of improved technical processes of manufacturing, to changed methods of market distribution. Nor is it often pointed out that the effect upon debtor-creditor relationships of price level changes depends in part upon the causes of the price displacement. A fall of prices, for instance, attributable to currency pressure undeniably injures the debtor. But if, on

the other hand, prices fall because of improved productive methods, it may be just as easy for debts to be paid as if per capita productivity had not increased.

But the writer will not disappoint those who insist upon a frankly monetary explanation of recent price level changes. Personally he believes that our domestic price level has been inflated for quite a time, even during short-run periods in which price averages have tended to decline. The general movement in this country's leading industries toward mass production, lowering unit costs, was stimulated not only by war-time examples but also by the revolution in sales methods which of a sudden made millions of dollars of consumers' credit available to installment purchasers. That in recent years technological improvements and economy-producing inventions have been introduced at a faster than average rate is indicated by the general tendency of unemployment to increase during periods in which new output records were being attained.

In the face of such powerful price depressing forces, prices were kept up only by the artificial encouragement of too much credit. This excessive credit operated most powerfully in the writer's opinion in the direction of providing leading manufacturing corporations with the opportunities to float abnormally large new issues for plant expansion projects. The funds obtained by these flotations were distributed to laborers and other classes in the carrying out of physical construction prospects and, when spent, helped to sustain the market demand for current products. Now, however, with the completion of many of these construction projects, we have the plant capacity, but we do not have the market. Prices have lately fallen because at an earlier time, before these powerful forces of decline had time to operate with full scope, we did not recognize that there could be too much credit in a price level which had not, at least for any long period of time, been advancing.

Abroad, foreign industry has received too much carrying credit directly or indirectly from the American investment market. There has been too much credit in rubber, wool,

wheat, tin, copper, and coffee. In concentrated degree we have lately reaped the consequences of failing to permit prices before the break to move downward in full sympathy with various depressing forces whose full influence was temporarily countered by abundant credit.

It is not to be denied that the above-stated conclusions depend very largely upon controversial judgment and sketchy observation. The revolutionary price-determining forces of recent years involve too much of the imponderable to warrant accurate measurement. But this admission need only imply that there is no way by which the task of central banking authorities could be made more onerous than to compel them to emphasize price stability obligations. No economic phenomena are more capricious, less capable of accurate prediction, than price movements. All the more dubious therefore becomes the program of charging central banks with the responsibility of coöperating to stabilize the value of gold. Central banking authorities should rather be encouraged to devote principal attention to such considerations as speculative developments, prevailing conditions in the construction industries, movements of goods to and from stocks, changes in the outstanding volume of bank credit, liquidity of bank portfolios. Frequently these considerations indicate with promptitude credit necessities which are only revealed in belated fashion by price level changes.

Despite many admitted errors of interpretation and analysis, the Federal Reserve System has made considerable progress in developing various economic and financial guides to credit policy, and it would be most unfortunate if, in the give and take of central banking coöperation, either informally or by means of definitely established machinery, this progress should be lost. It is for this reason that the writer deplores the excessive emphasis upon price movements which now seems to characterize the thinking of so many of the leading exponents of international banking coöperation. It is agreed that it will be desirable to develop closer accord between the world's central banks than has thus far been realized. But in welcoming such coöperation our reserve

administration must insist that it is not subscribing to the doctrine that in price movements we invariably have the most conclusive indication of the soundness of a country's credit and currency structure.

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